US009250028B2

(12) **United States Patent**
Taira et al.

(10) **Patent No.: US 9,250,028 B2**
(45) **Date of Patent: Feb. 2, 2016**

(54) **AIR CONDITIONER**

(71) Applicant: **FUJITSU GENERAL LIMITED**, Kawasaki-Shi, Kanagawa (JP)

(72) Inventors: **Ritsushi Taira**, Kanagawa (JP); **Shinji Sugiyama**, Kanagawa (JP); **Kenji Haruyama**, Kanagawa (JP); **Syun Iwano**, Kanagawa (JP); **Fumiaki Tanaka**, Kanagawa (JP)

(73) Assignee: **FUJITSU GENERAL LIMITED**, Kanagawa (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 358 days.

(21) Appl. No.: **13/872,875**

(22) Filed: **Apr. 29, 2013**

(65) **Prior Publication Data**

US 2013/0284411 A1 Oct. 31, 2013

(30) **Foreign Application Priority Data**

Apr. 27, 2012 (JP) 2012-103522

(51) **Int. Cl.**
F24F 1/00 (2011.01)
F24F 11/00 (2006.01)
F28F 13/06 (2006.01)

(52) **U.S. Cl.**
CPC ***F28F 13/06*** (2013.01); ***F24F 1/0033*** (2013.01); ***F24F 11/0078*** (2013.01); *F24F 2001/0048* (2013.01)

(58) **Field of Classification Search**
CPC F24F 1/0033; F24F 1/0018; F24F 1/0025; F24F 1/01; F24F 1/0014; F24F 1/0011; F24F 2001/0048; F24F 11/0078; F28F 13/06
USPC 165/126, 127
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,999,370	A *	9/1961	Eberhart	62/325
5,467,606	A *	11/1995	Sasaki et al.	62/160
2009/0107167	A1*	4/2009	Kim et al.	62/426
2009/0114377	A1*	5/2009	Zheng et al.	165/126
2010/0132393	A1*	6/2010	Kim et al.	62/296

FOREIGN PATENT DOCUMENTS

EP	1813880	A1 *	8/2007
EP	2208946	A1 *	7/2010

(Continued)

OTHER PUBLICATIONS

Entire Prosecution History of U.S. Appl. No. 13/872,830, filed Apr. 29, 2013, entitled "Air Conditioner".

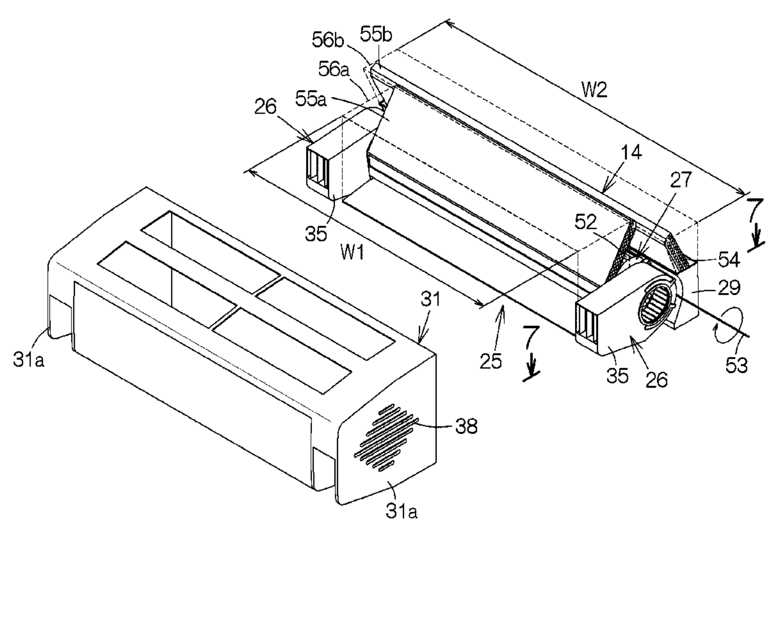
(Continued)

Primary Examiner — Tho V Duong
(74) *Attorney, Agent, or Firm* — McDermott Will & Emery LLP

(57) **ABSTRACT**

An air conditioner includes a main unit having an enclosure defining an air outlet. The enclosure contains a heat exchanger generating a cool air or a warm air forming airflow running out of the air outlet. A pair of fan units are disposed on the opposite sides of the air outlet. The fan units are configured to suck a room air and to blow the room air. The heat exchanger includes a rear section having a length larger than that of a front section in the longitudinal direction of the air outlet. The rear section extends into at least one of spaces respectively defined behind the fan units.

3 Claims, 18 Drawing Sheets



(56) **References Cited**

FOREIGN PATENT DOCUMENTS

JP	55121342	A	*	9/1980
JP	2000-297792	A		10/2000
JP	2003-130381	A		5/2003
JP	2008-281212	A		11/2008
JP	2010-164271	A		7/2010

OTHER PUBLICATIONS

Entire Prosecution History of U.S. Appl. No. 13/872,816, filed Apr. 29, 2013, entitled "Controller Circuit for Air Conditioner and Computer-Readable Storage Medium Containing Program Instructions for Controlling Conditioner".

* cited by examiner

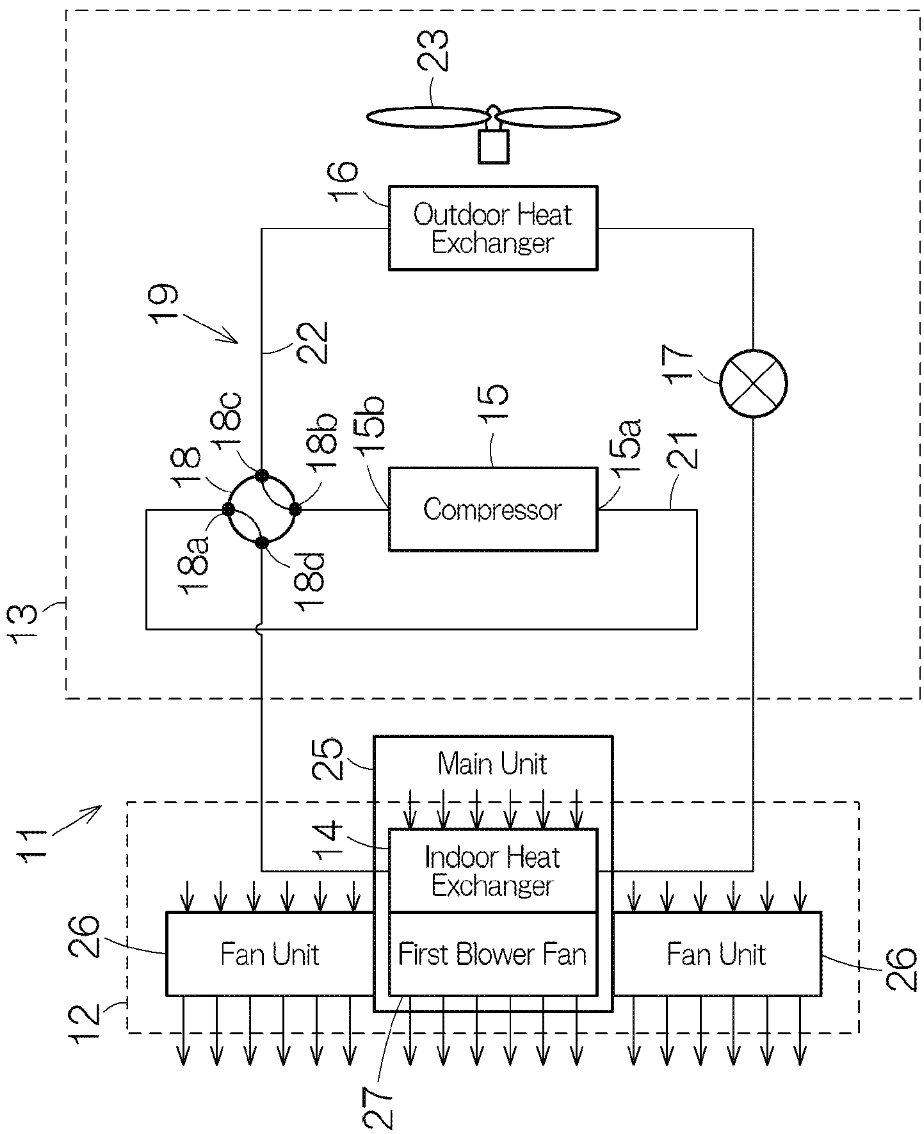

23
16
Outdoor Heat Exchanger
19
22
17
15
18c
18
18b
15b
15a
21
Compressor
18a
18d
13
25
Main Unit
11
14
Indoor Heat Exchanger
26
Fan Unit
First Blower Fan
Fan Unit
26
12
27

FIG.1

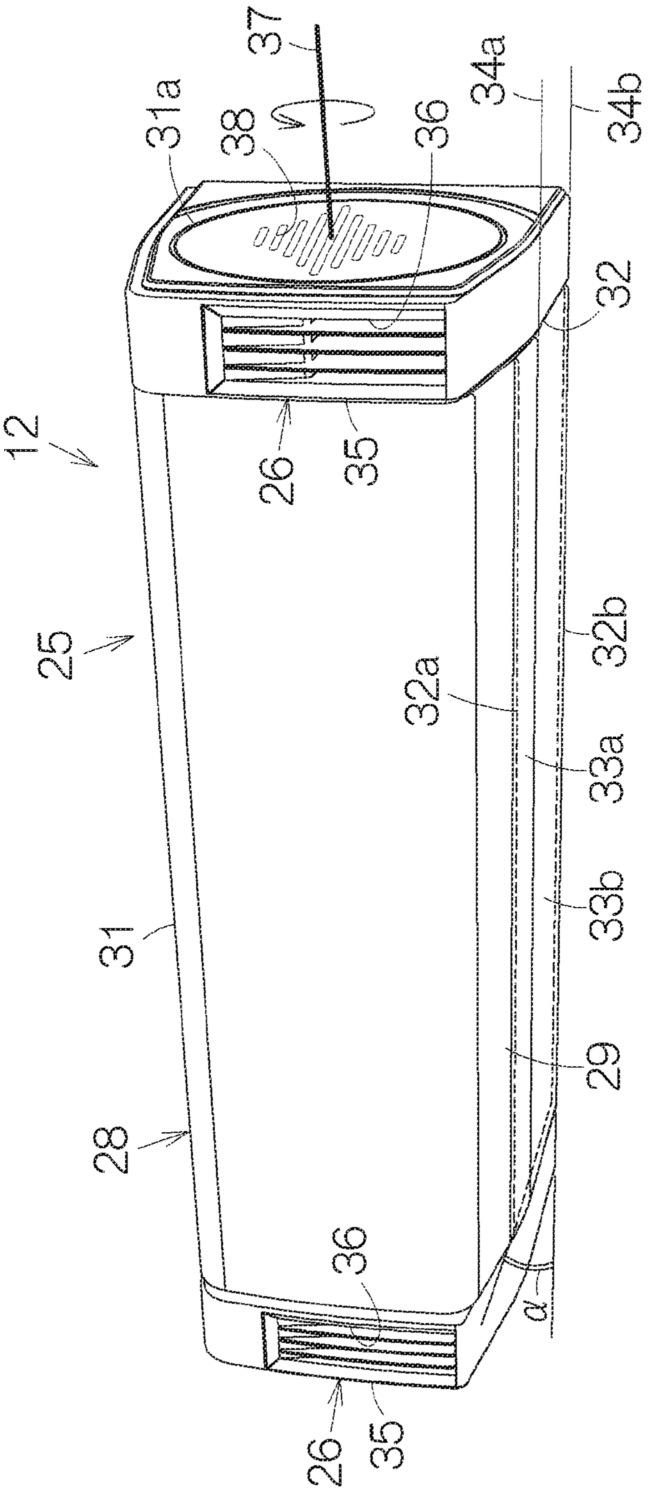

37
34a
31a
38
36
34b
32
12
26
35
25
32b
32a
33a
33b
31
29
28
36
α
26
35

FIG.2

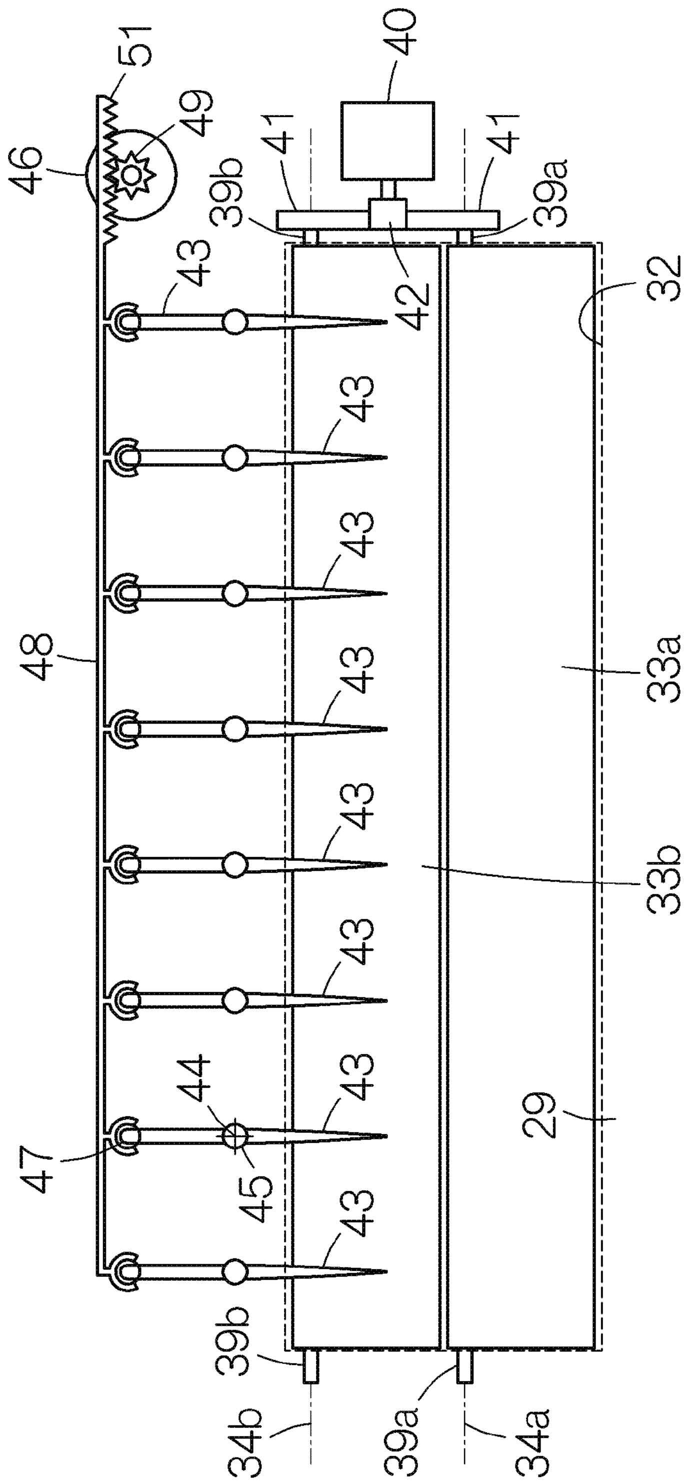

51
49
46
40
41
41
39b
39a
42
43
32
48
33a
33b
44
45
47
29
39b
34b
39a
34a

FIG.3

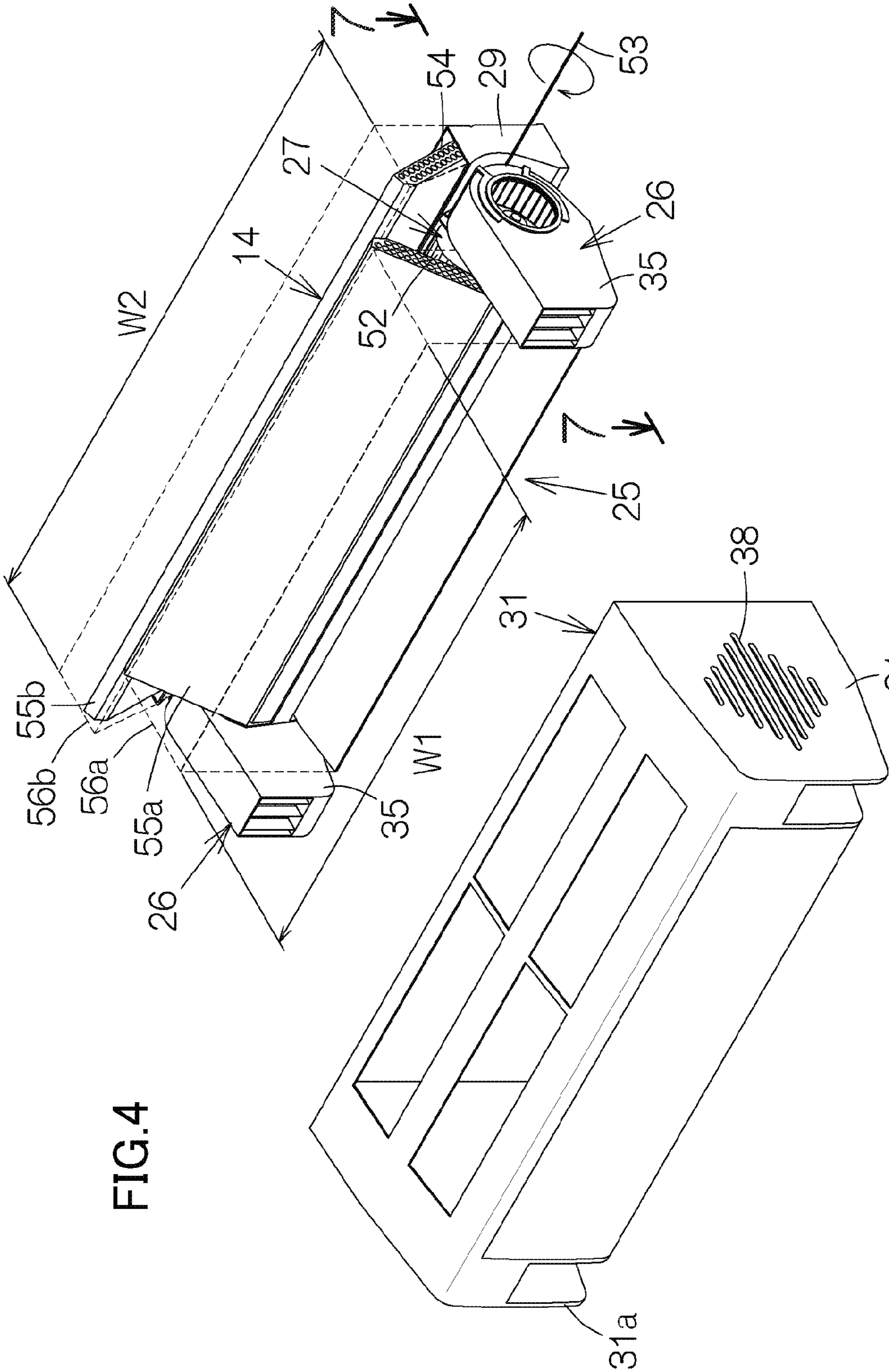

7
54
29
53
27
26
14
W2
35
52
7
25
38
31
31a
55b
56b
56a
55a
35
W1
26
31a

FIG.4

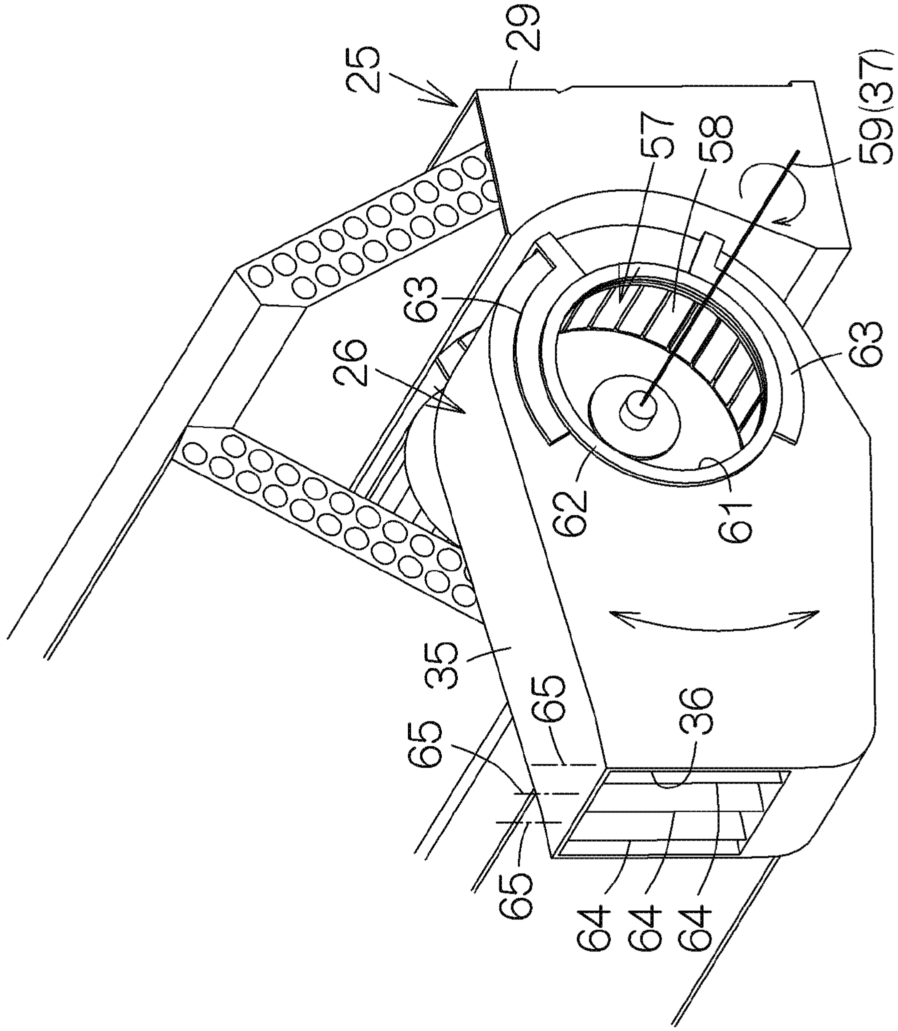


FIG.5

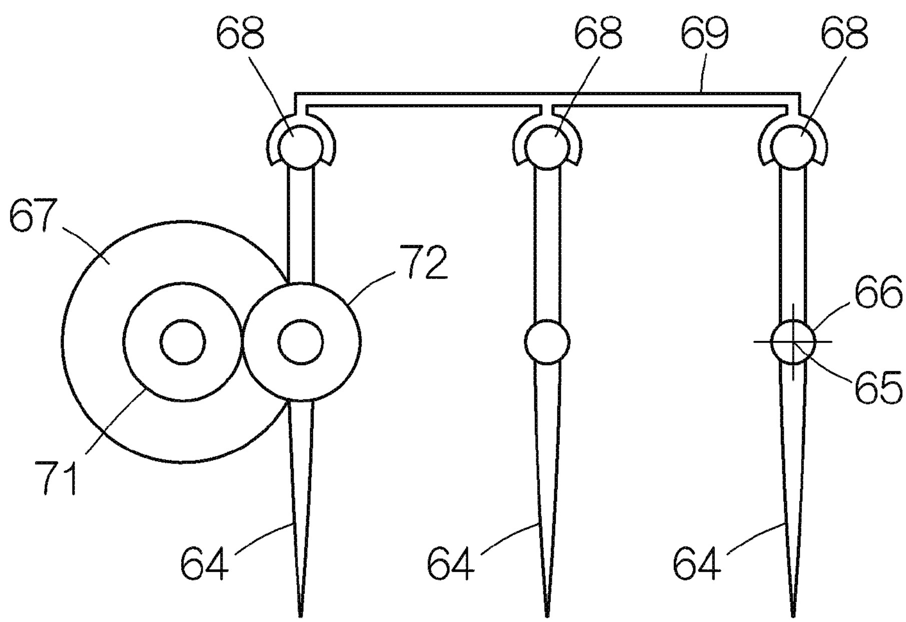


FIG.6

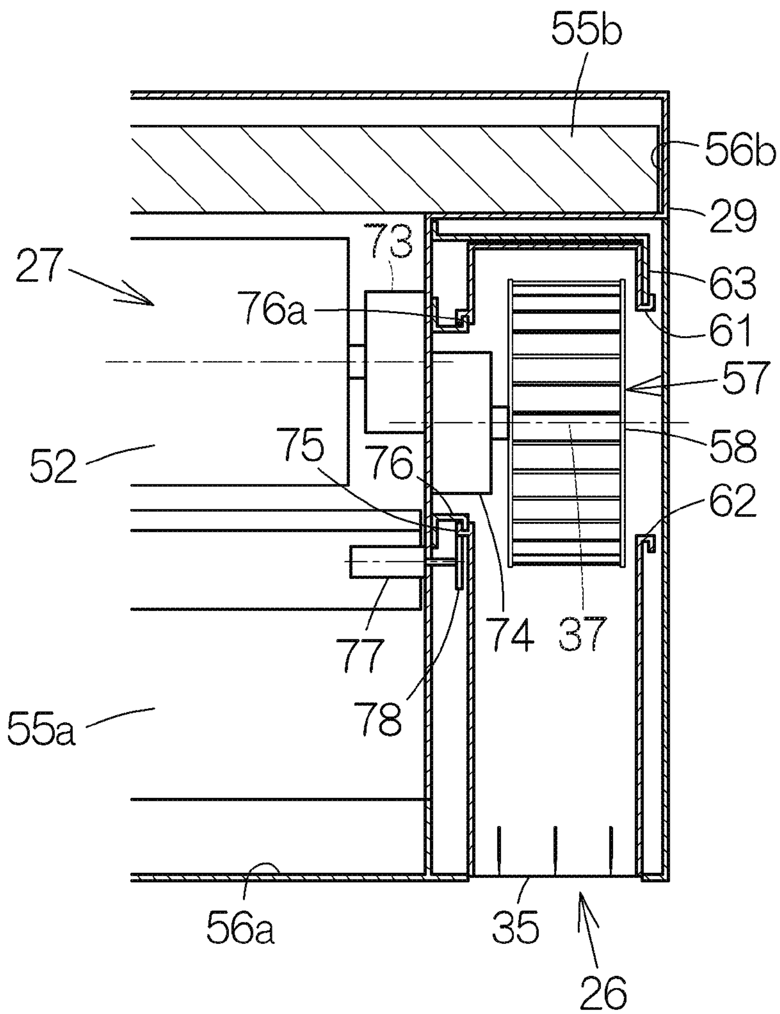
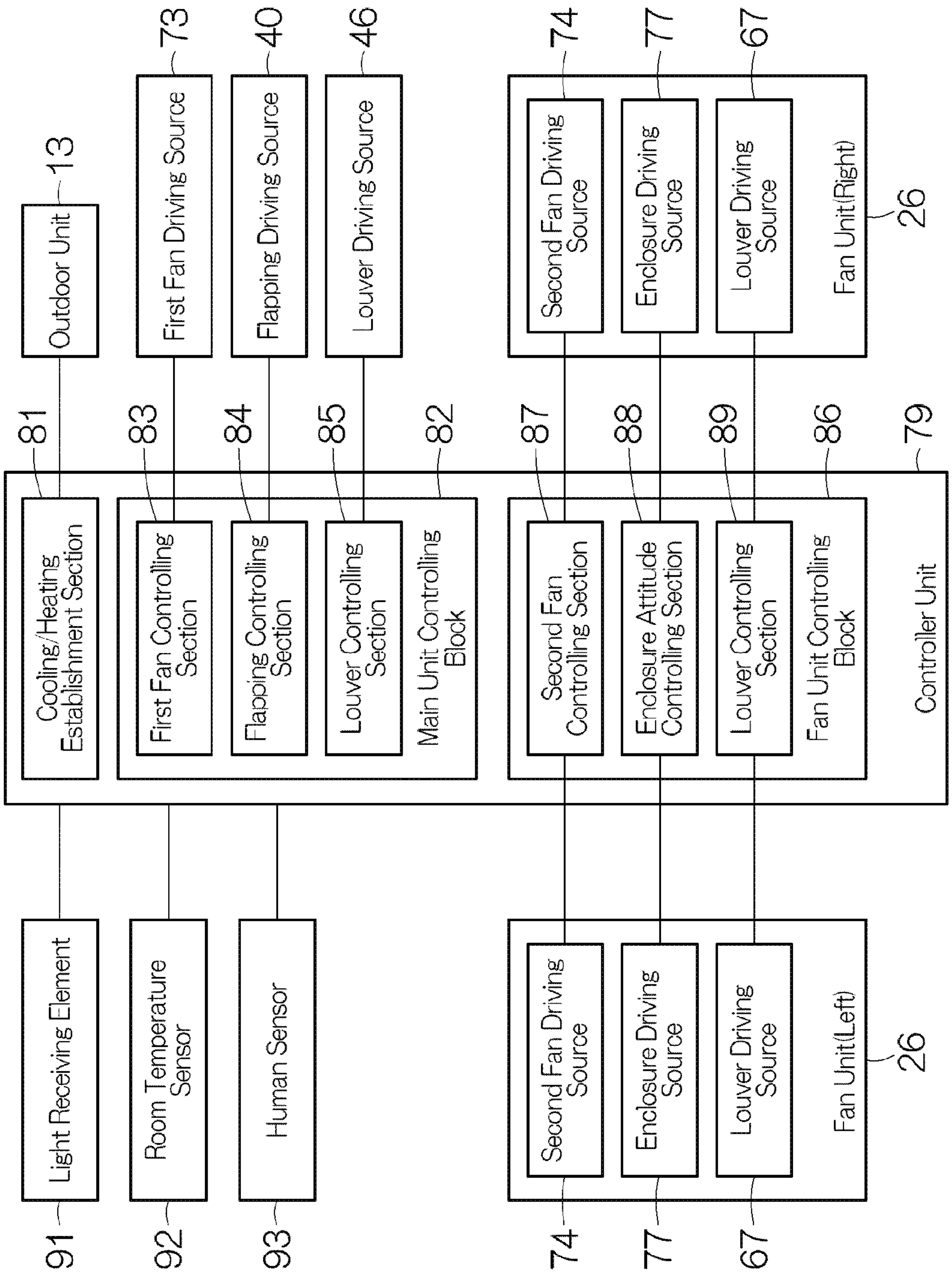


FIG.7

FIG.8


Outdoor Unit
13
First Fan Driving Source
73
Flapping Driving Source
40
Louver Driving Source
46
Second Fan Driving Source
74
Enclosure Driving Source
77
Louver Driving Source
67
Fan Unit(Right)
26
Cooling/Heating Establishment Section
81
First Fan Controlling Section
83
Flapping Controlling Section
84
Louver Controlling Section
85
Main Unit Controlling Block
82
Second Fan Controlling Section
87
Enclosure Attitude Controlling Section
88
Louver Controlling Section
89
Fan Unit Controlling Block
86
Controller Unit
79
Light Receiving Element
91
Room Temperature Sensor
92
Human Sensor
93
Second Fan Driving Source
74
Enclosure Driving Source
77
Louver Driving Source
67
Fan Unit(Left)
26

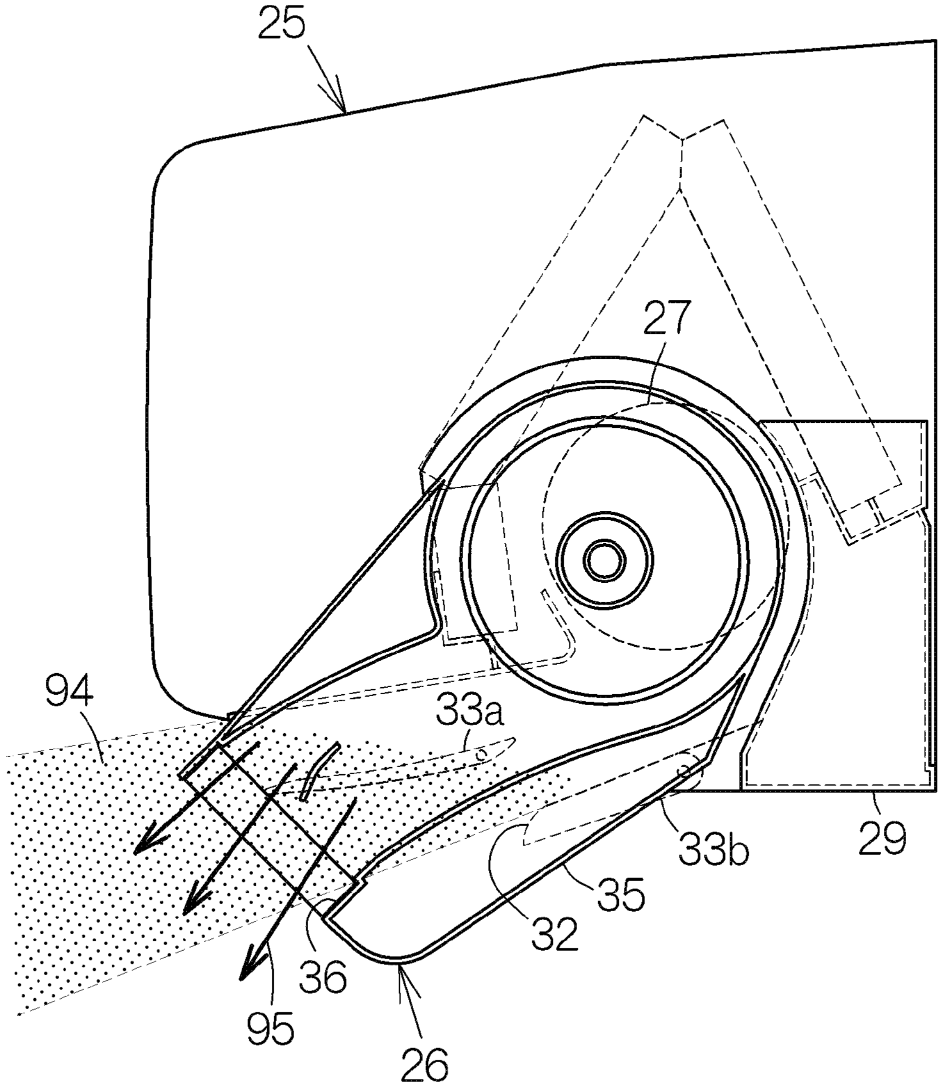


FIG.9

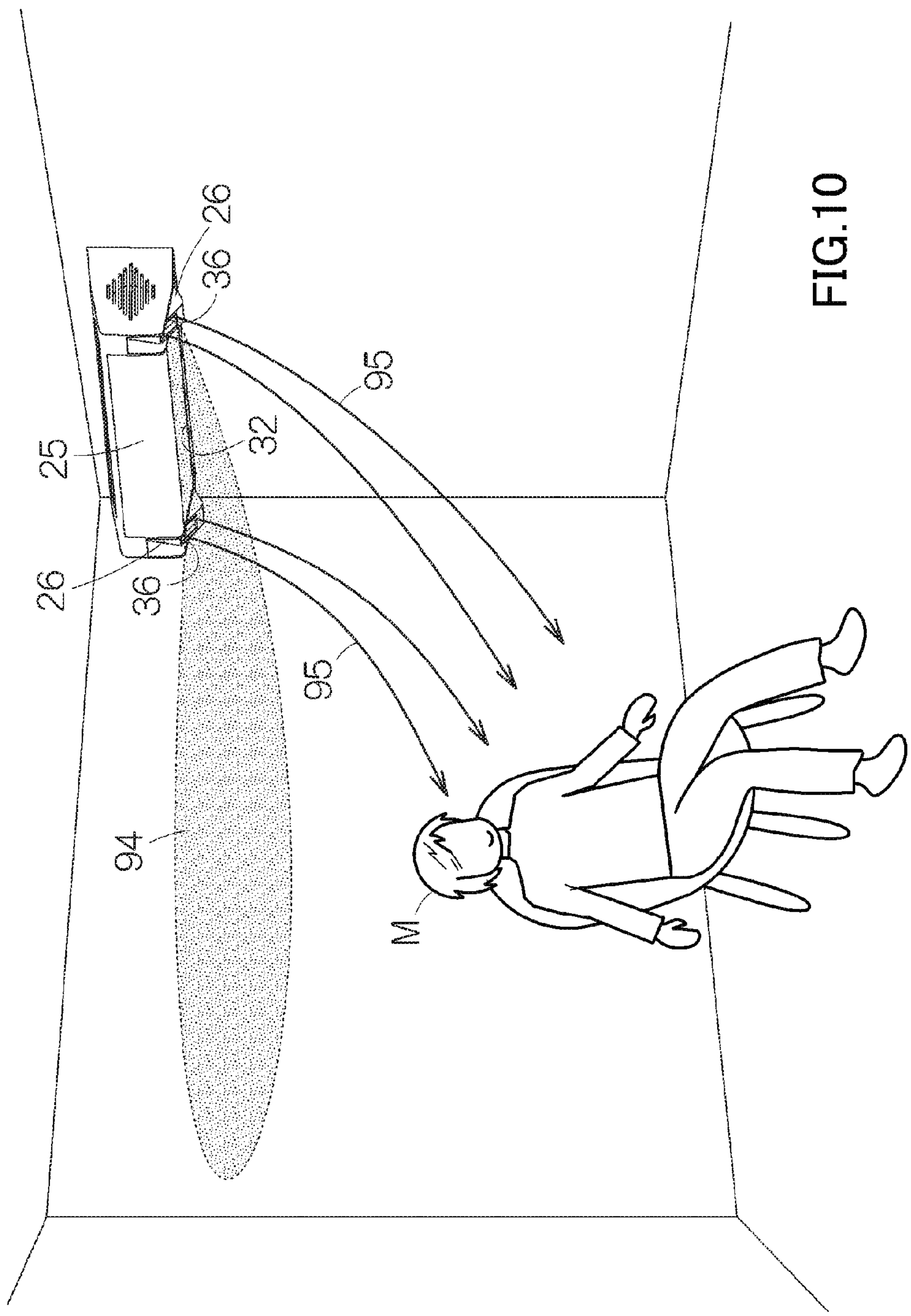


FIG.10

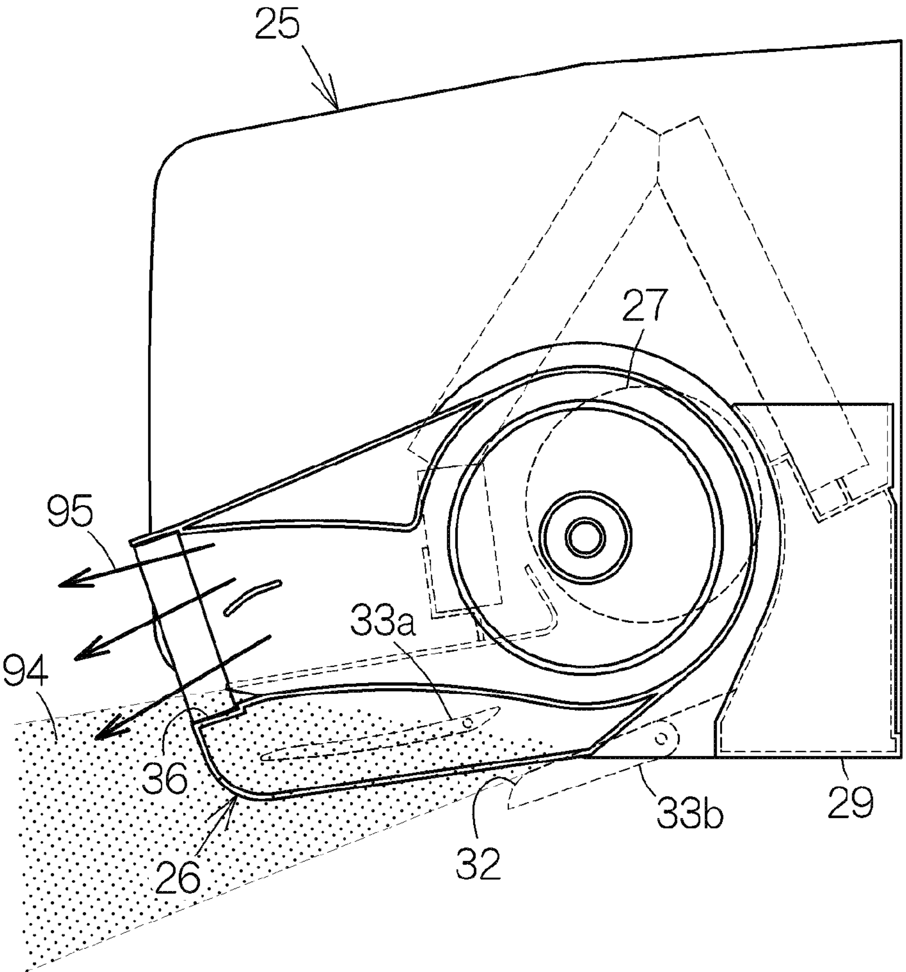


FIG.11

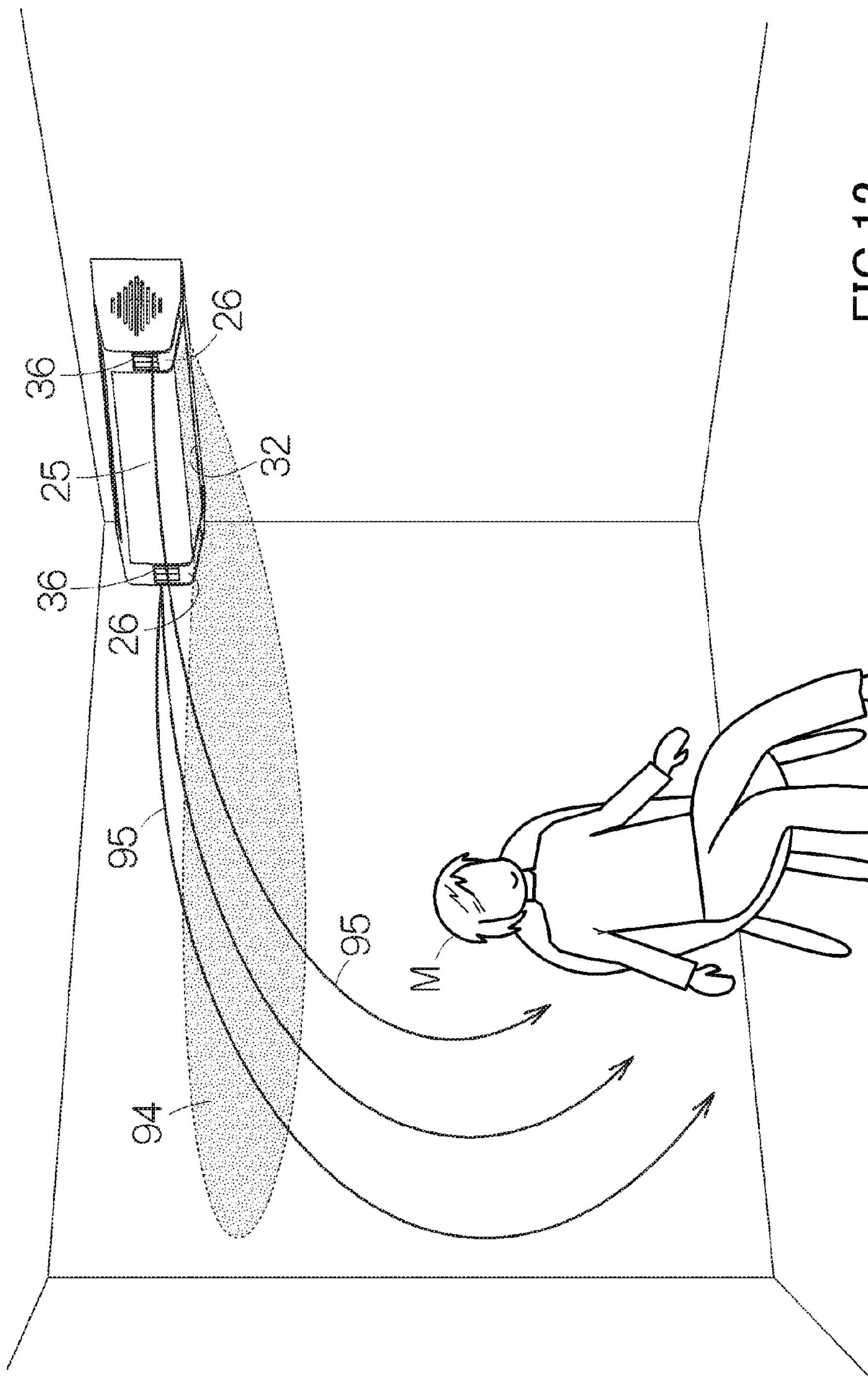


FIG.12

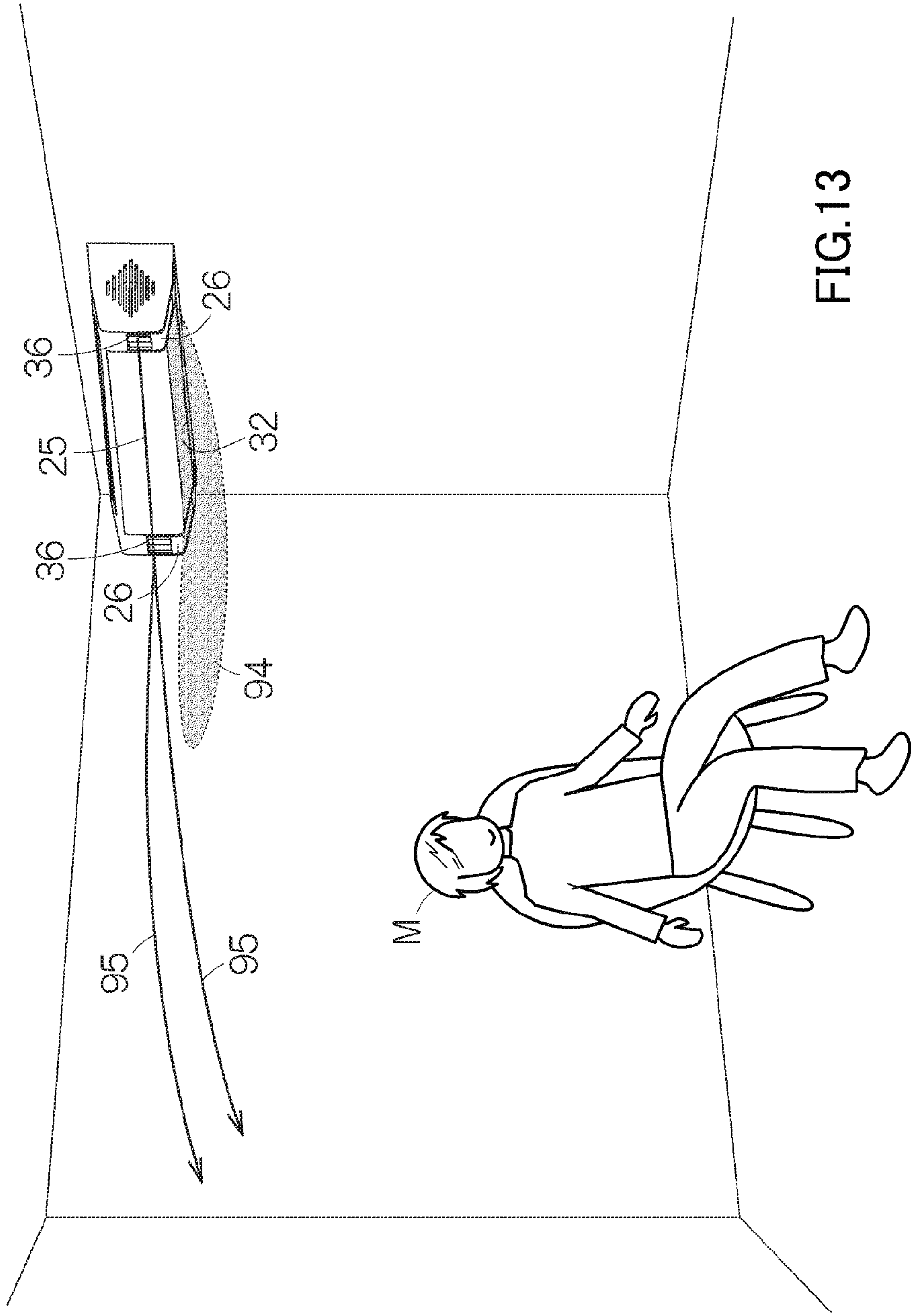


FIG.13

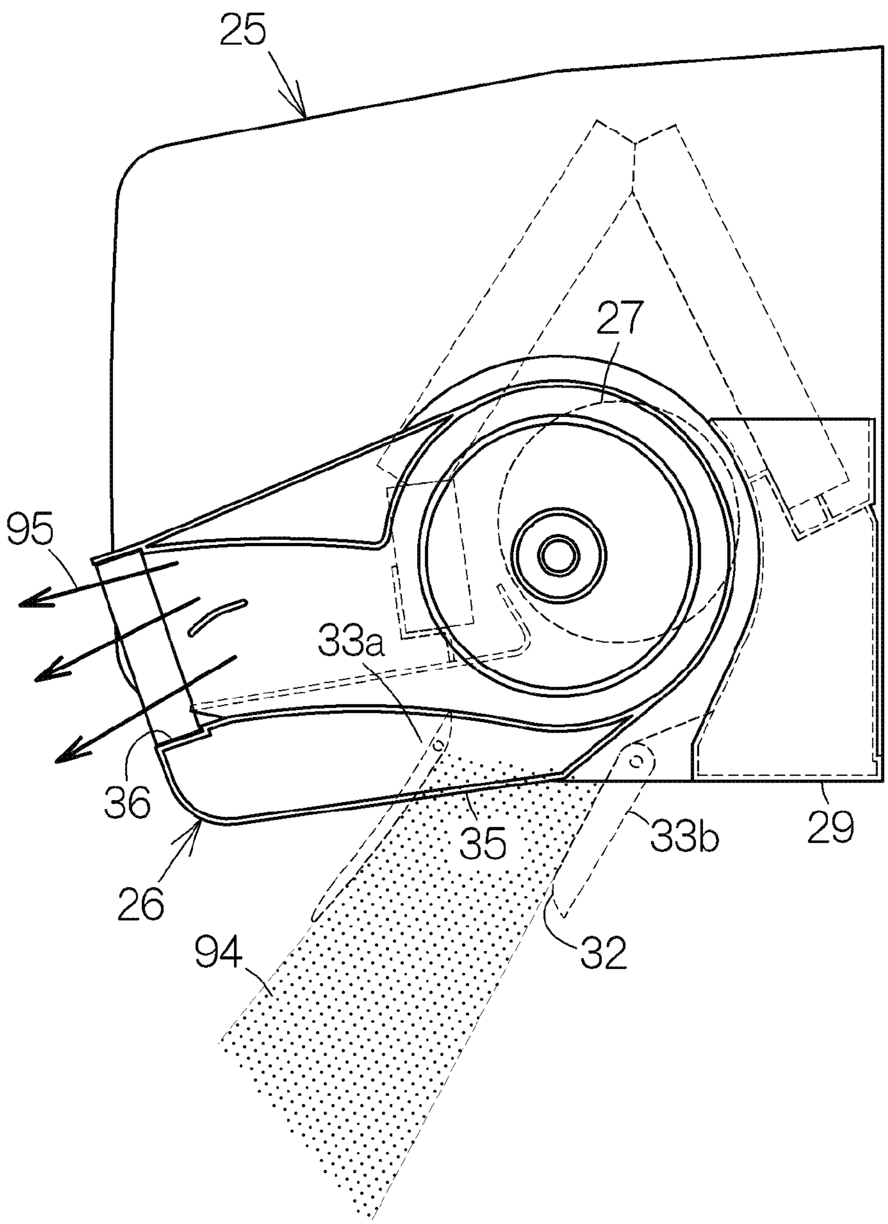


FIG.14

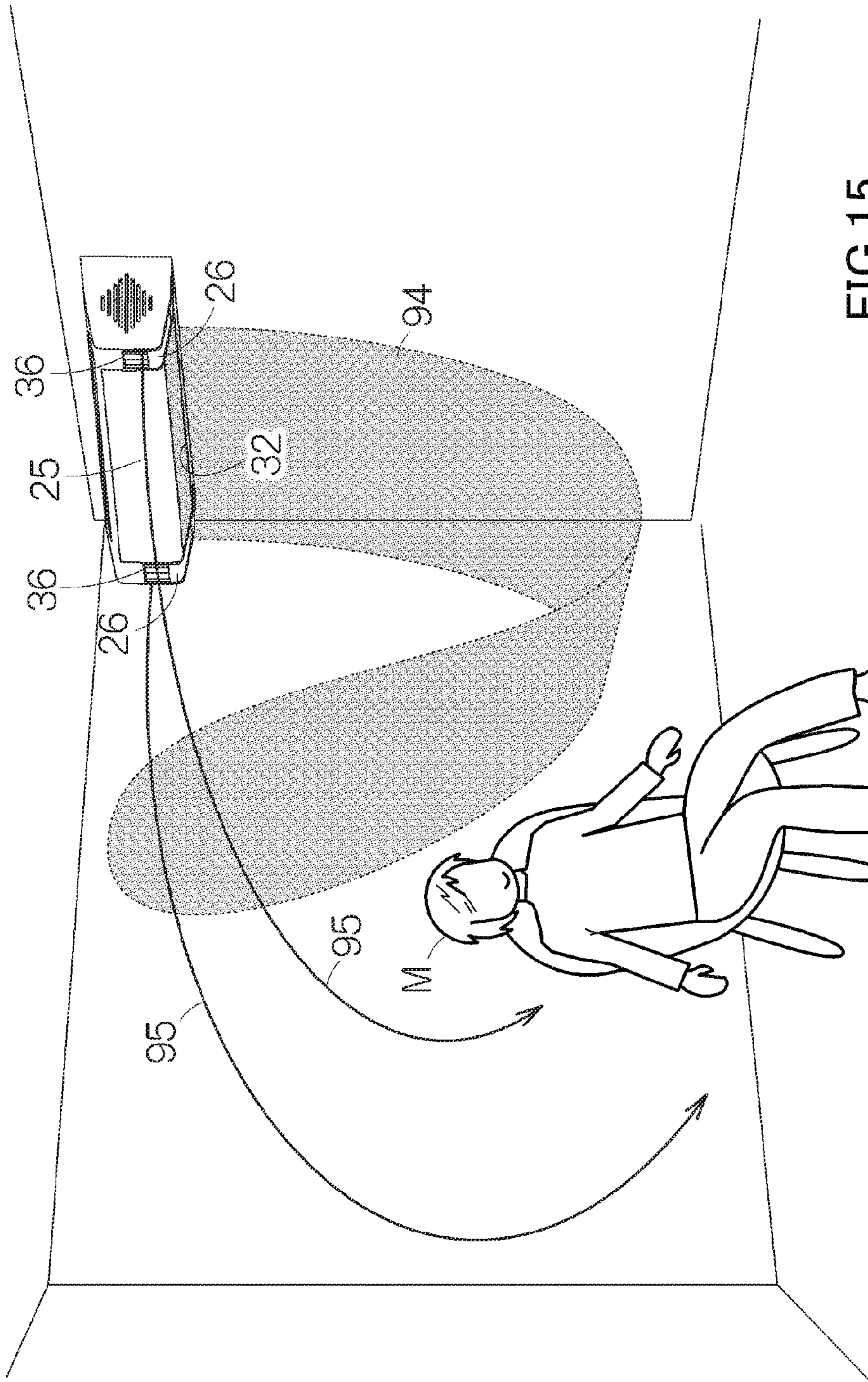


FIG.15

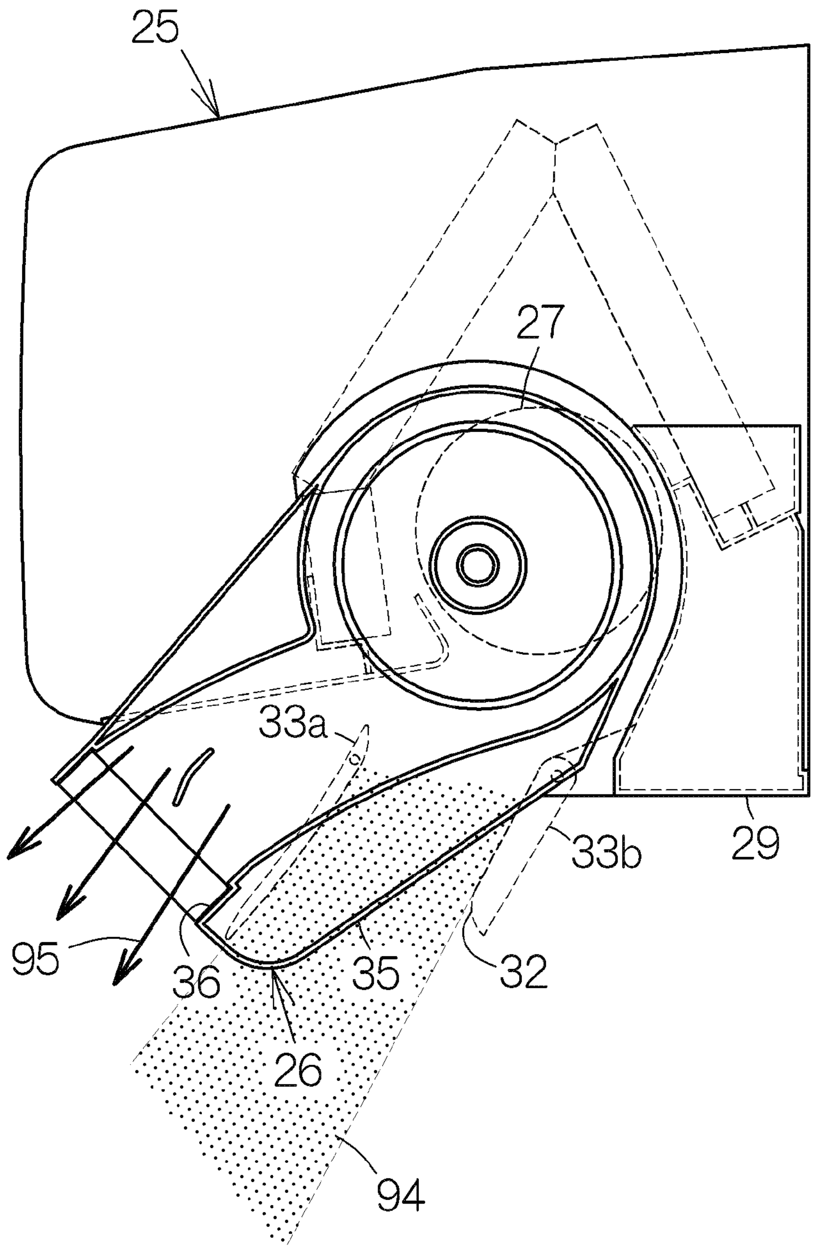


FIG.16

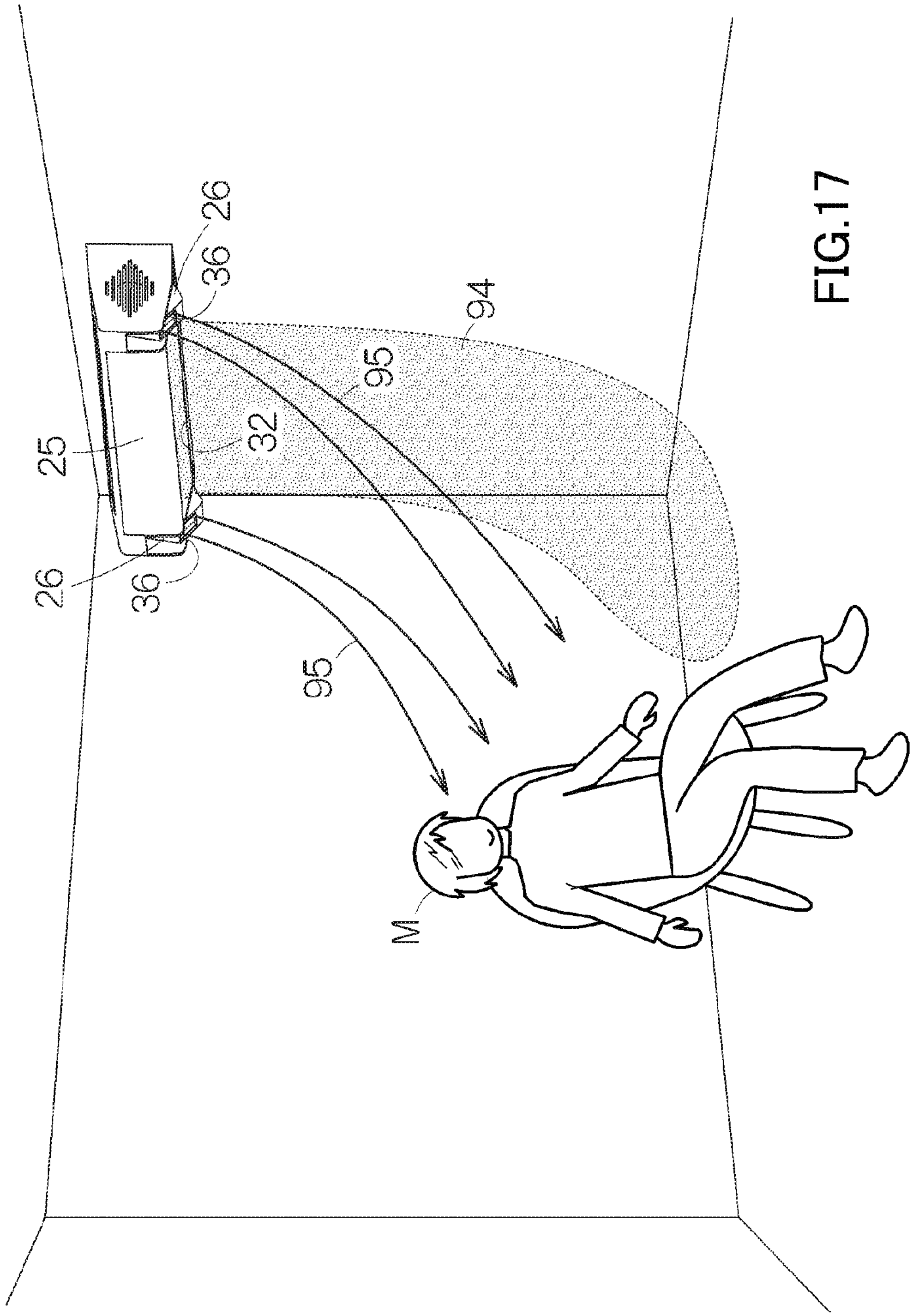


FIG.17

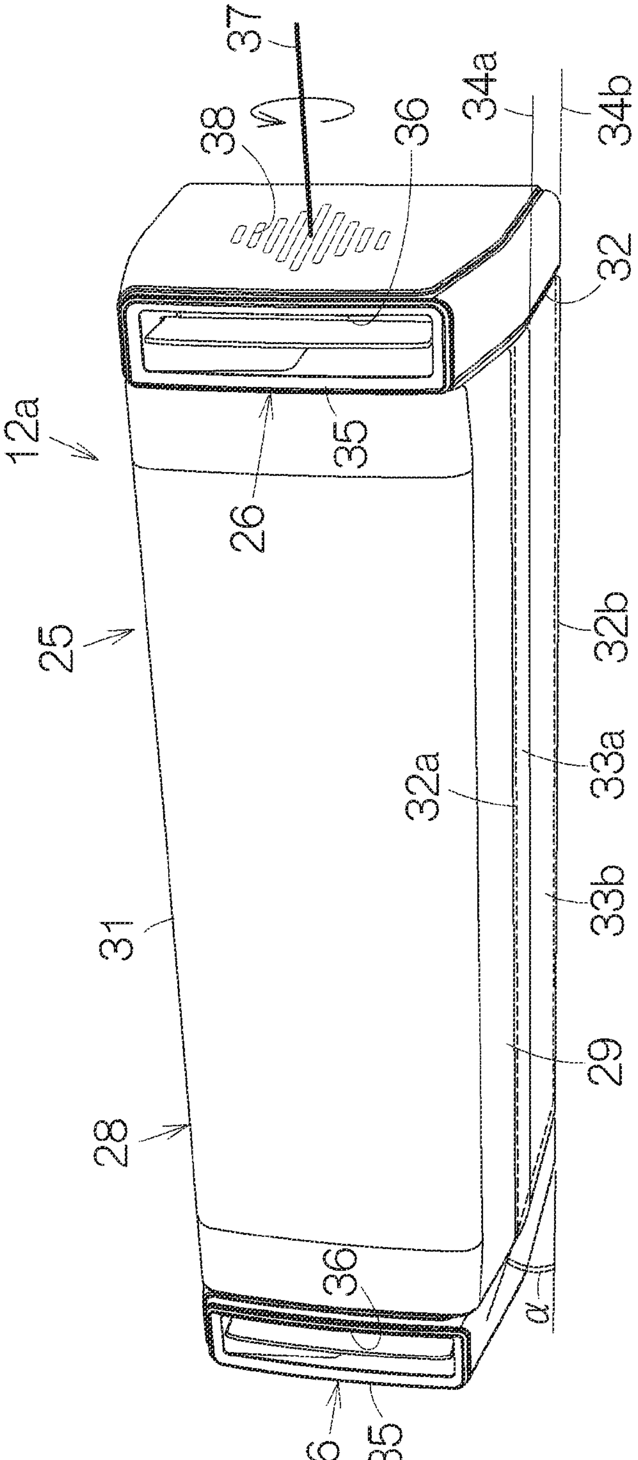


FIG.18

AIR CONDITIONER

CROSS-REFERENCE TO RELATED APPLICATION

This application is based upon and claims the benefit of priority from the prior Japanese Patent Application No. 2012-103522 filed on Apr. 27, 2012, the entire contents of which are incorporated herein by reference.

FIELD

The present invention relates to an air conditioner.

BACKGROUND

An air conditioner is configured to generate a cool or warm air through heat exchange for making an airflow of the cool or warm air out of an air outlet of an indoor unit. As disclosed in Japanese Patent Application Publication Nos. 2008-281212 and 2003-130381, some air conditioners include second air outlets beside the air outlet all formed in an enclosure of the indoor unit. The second air outlets are utilized to make an additional airflow of the cool or warm air. The indoor unit is allowed to spread the cool or warm air over a wider area as compared with an indoor unit having a single air outlet.

In general, the indoor unit includes horizontal flaps and vertical louvers at the air outlet. The horizontal flaps and the vertical louvers are utilized to regulate the direction of the outgoing airflow. However, once the airflow is released from the air outlet, the direction and movement of the airflow afterward depend on the natural convection. If such direction and movement of the airflow can be controlled more delicately, a comfortable temperature environment one has not ever experienced can be established in a room. It is desirable to avoid an increase in size or volume of the air conditioner irrespective of the realization of the control on the direction and movement of the airflow. It is not preferable that avoidance of an increase in size or volume of the air conditioner results in a reduction in the heat exchange efficiency of the air conditioner.

SUMMARY

One aspect of the present invention may provide an air conditioner contributing to establishment of a comfortable temperature environment with the heat exchange efficiency kept higher to the utmost.

According to one aspect of the present invention, there is provided an air conditioner comprising: a main unit having an enclosure defining an air outlet, the enclosure containing a heat exchanger generating a cool air or a warm air forming an airflow running out of the air outlet; and a pair of fan units disposed on opposite sides of the air outlet, the fan units being configured to suck a room air and to blow the room air, wherein the heat exchanger includes: a front section disposed in a space between the fan units; and a rear section having a length larger than that of the front section in the longitudinal direction of the air outlet, wherein the rear section extends into at least one of spaces respectively defined behind the fan units.

The air conditioner allows airflow of the cool air or the warm air to run out of the air outlet. Airflow of the room air is blown out of the fan units. The airflow of the room air can be utilized to control the direction and/or movement of the airflow of the cool air or the warm air. The cool air or the warm air can be conveyed to desired locations. The temperature environment can efficiently be enhanced or improved in the room. In addition, the air conditioner enables an effective utilization of the space behind the fan unit to contain a portion of the rear section of the heat exchanger. Accordingly, a reduction in the size or volume of the heat exchanger can to the utmost be suppressed or avoided irrespective of the presence of the fan units.

The air conditioner may further comprise: a first driving source configured to drive a first blower fan contained inside the enclosure; and a second driving source, independent of the first driving source, configured to drive a second blower fan contained in the enclosure of each of the fan units. The flow rate of the airflow of the room air can be set different from the flow rate of the airflow of the cold air or the warm air. The airflow having a larger flow rate can be utilized to restrict the airflow having a smaller flow rate. A reliable control can in this manner be achieved on the direction and/or movement of the airflow of the cool air or the warm air.

The fan units may be supported on the main unit for a relative attitude change to the main unit in the air conditioner. Air outlets of the fan units can be moved relative to the air outlet of the main unit. Accordingly, the airflow of the room air can be set in a desirable direction. The controlled direction of the airflow of the room air enables an appropriate control on the direction and/or movement of the airflow of the cool air or the warm air.

The object and advantages of the embodiment will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims. It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory and are not restrictive of the embodiment, as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic view illustrating the structure of an air conditioner according to one embodiment of the present invention.

FIG. **2** is a perspective view schematically illustrating the structure of an indoor unit according to a first embodiment.

FIG. **3** is a plan view schematically illustrating horizontal flaps and vertical louvers in a main unit.

FIG. **4** is an exploded view of the main unit.

FIG. **5** is an enlarged perspective view of a fan unit.

FIG. **6** is a plan view schematically illustrating vertical louvers in the fan unit.

FIG. **7** is a horizontal cross-sectional view taken along the line **7-7** in FIG. **4**.

FIG. **8** is a block diagram schematically illustrating a controlling system of the air conditioner.

FIG. **9** is a schematic view illustrating the attitude of the horizontal flaps and the attitude of the fan units when a first mode of the cooling operation has been selected.

FIG. **10** is a schematic view illustrating the flow of air in a room when the first mode of the cooling operation has been selected.

FIG. **11** is a schematic view illustrating the attitude of the horizontal flaps and the attitude of the fan units when a second mode of the cooling operation has been selected.

FIG. **12** is a schematic view illustrating the flow of air in the room when the second mode of the cooling operation has been selected.

FIG. **13** is a schematic view illustrating the flow of air in the room when the third mode of the cooling operation has been selected.

FIG. **14** is a schematic view illustrating the attitude of the horizontal flaps and the attitude of the fan units when a first mode of the heating operation has been selected.

FIG. **15** is a schematic view illustrating the flow of air in the room when the first mode of the heating operation has been selected.

FIG. **16** is a schematic view illustrating the attitude of the horizontal flaps and the attitude of the fan units when a second mode of the heating operation has been selected.

FIG. **17** is a schematic view illustrating the flow of air in the room when the second mode of the heating operation has been selected.

FIG. **18** is a perspective view schematically illustrating the structure of an indoor unit according to a second embodiment.

DESCRIPTION OF EMBODIMENT

FIG. **1** schematically illustrates the structure of an air conditioner **11** according to one embodiment of the present invention. The air conditioner **11** includes an indoor unit **12** and an outdoor unit **13**. The indoor unit **12** is located in a room space in a building, for example. Otherwise, the indoor unit **12** may be located in an environmental space equivalent to the room space. An indoor heat exchanger **14** is assembled in the indoor unit **12**. A compressor **15**, an outdoor heat exchanger **16**, an expansion valve **17** and a four-way valve **18** are assembled in the outdoor unit **13**. A refrigerant circuit **19** is established with a combination of the indoor heat exchanger **14**, the compressor **15**, the outdoor heat exchanger **16**, the expansion valve **17** and the four-way valve **18**.

The refrigerant circuit **19** includes a first circulating path **21**. The first circulating path **21** connects a first port **18***a* of the four-way valve **18** and a second port **18***b* of the four-way valve **18** to each other. A suction port **15***a* of the compressor **15** is connected to the first port **18***a* of the four-way valve **18** through a refrigerant piping. A gaseous refrigerant is supplied to the suction port **15***a* of the compressor **15** from the first port **18***a*. The compressor **15** is configured to compress the gaseous refrigerant of a low pressure to a predetermined higher pressure. A discharge port **15***b* of the compressor **15** is connected to the second port **18***b* of the four-way valve **18** through a refrigerant piping. The gaseous refrigerant is supplied to the second port **18***b* of the four-way valve **18** from the discharge port **15***b* of the compressor **15**. A refrigerant piping such as a copper piping is utilized to form the first circulating path **21**.

The refrigerant circuit **19** further includes a second circulating path **22**. The second circulating path **22** connects a third port **18***c* of the four-way valve **18** and a fourth port **18***d* of the four-way valve **18** to each other. The outdoor heat exchanger **16**, the expansion valve **17** and the indoor heat exchanger **14** are assembled in the second circulating path **22** in this sequence from the third port **18***c*. The outdoor heat exchanger **16** serves to exchange the thermal energy between the passing refrigerant and the ambient air. The indoor heat exchanger **14** serves to exchange the thermal energy between the passing refrigerant and the ambient air. A refrigerant piping such as a copper piping is utilized to form the second circulating path **22**.

An outdoor unit fan **23** is assembled in the outdoor unit **13**. The outdoor unit fan **23** is associated with the outdoor heat exchanger **16**. The outdoor unit fan **23** is configured to drive the impeller for rotation, for example, so as to generate airflow. The airflow passes through the outdoor heat exchanger **16**. The flow rate of the airflow passing through the outdoor heat exchanger **16** depends on the rotation speed of the impeller. The flow rate of the airflow is utilized to adjust the quantity of the thermal energy exchanged between the refrigerant and the ambient air at the outdoor heat exchanger **16**.

The indoor unit **12** includes a main unit **25** and a pair of fan units **26**. The indoor heat exchanger **14** and a first blower fan **27** are assembled in the main unit **25**. The first blower fan **27** is associated with the indoor heat exchanger **14**. The first blower fan **27** is configured to drive the impeller for rotation, for example, so as to generate airflow. The first blower fan **27** operates to induce the suction of the room air into the main unit **25**. The room air passes through the indoor heat exchanger **14**. The heat exchanger generates a cool air or a warm air which is discharged out of the main unit **25**. The flow rate of the airflow passing through the indoor heat exchanger **14** depends on the rotation speed of the impeller. The flow rate of the airflow is utilized to adjust the quantity of the thermal energy exchanged between the refrigerant and the ambient air at the indoor head exchanger **14**. The fan unit **26** is configured to suck the room air and to discharge the room air as it is, specifically without being intentionally cooled or heated.

When the refrigerant circuit **19** works in the cooling operation, the four-way valve **18** connects the second port **18***b* and the third port **18***c* to each other as well as the first port **18***a* and the fourth port **18***d* to each other. The refrigerant of a high temperature and a high pressure is supplied to the outdoor heat exchanger **16** from the discharge port **15***b* of the compressor **15**. The refrigerant circulates through the outdoor heat exchanger **16**, the expansion valve **17** and the indoor heat exchanger **14** in this sequence. The thermal energy of the refrigerant is released into the outdoor atmosphere at the outdoor heat exchanger **16**. The refrigerant is decompressed to a low pressure at the expansion valve **17**. The decompressed refrigerant absorbs heat from the ambient air at the indoor heat exchanger **14**. A cool air is thus generated. The cool air is forced to flow into the room with the assistance of the action of the first blower fan **27**.

When the refrigerant circuit **19** works in the heating operation, the four-way valve **18** connects the second port **18***b* and the fourth port **18***d* to each other as well as the first port **18***a* and the third port **18***c* to each other. The refrigerant of a high temperature and a high pressure is supplied to the indoor heat exchanger **14**. The refrigerant circulates through the indoor heat exchanger **14**, the expansion valve **17** and the outdoor heat exchanger **16** in this sequence. The thermal energy of the refrigerant is released to the ambient air at the indoor heat exchanger **14**. A warm air is thus generated. The warm air is forced to flow into the room with the assistance of the action of the first blower fan **27**. The refrigerant is decompressed to a low pressure at the expansion valve **17**. The decompressed refrigerant absorbs heat from the ambient air at the outdoor heat exchanger **16**. The refrigerant thereafter returns to the compressor **15**.

FIG. **2** schematically illustrates the indoor unit **12** according to a first embodiment. The main unit **25** of the indoor unit **12** includes a main enclosure **28**. The main enclosure **28** includes an enclosure body **29** and an outer panel **31** covering over the enclosure body **29**. A first air outlet **32** is defined in the enclosure body **29**. A first air inlet, not depicted, is defined in the outer panel **31**. The first air outlet **32** is an opening facing downward. The enclosure body **29** is mounted onto the wall of the room, for example. The first air outlet **32** has the front end **32***a* located at a level higher from the floor than the level of the rear end **32***b*. The first air outlet **32** thus takes an ascendant attitude by an ascending angle of α (alpha) relative to the horizontal plane. This ascending angle of α enables not only the discharge of the airflow directed downward toward the floor from the first air outlet **32** but also the discharge of the airflow in the horizontal direction in parallel with the floor.

A pair of horizontal flaps, namely front and rear horizontal flaps **33***a*, **33***b* are located in the first air outlet **32**. The horizontal flaps **33***a*, **33***b* are configured to rotate around horizontal axes **34***a*, **34***b*, respectively. The horizontal axes **34***a*, **34***b* may be positioned at the rear ends of the horizontal flaps **33***a*, **33***b*. The horizontal flaps **33***a*, **33***b* serve to open and close the first air outlet **32** in response to the swinging movements of the horizontal flaps **33***a*, **33***b*.

Fan units **26** are disposed and mounted on the opposite side surfaces of the enclosure body **29**, respectively. The fan units **26** are located outside the side walls of the enclosure body **29**. Each of the fan units **26** includes an enclosure **35**. A second air outlet **36** is defined in the enclosure **35** of the fan unit **26**. The second air outlet **36** is allowed to move around a horizontal axis **37**, as described later in detail. The horizontal axes **34***a*, **34***b*, **37** extend in parallel with one another. The side surface of the enclosure **35** is covered with a side panel **31***a* of the outer panel **31**. A second air inlet **38** is defined in the side panel **31***a*. The second air inlet **38** may be a group of small openings, for example.

As depicted in FIG. **3**, left and right protruding shafts **39***a*, **39***b* are formed on the horizontal flaps **33***a*, **33***b* in a manner coaxial with the horizontal axes **34***a*, **34***b*, respectively. The protruding shafts **39***a*, **39***b* protrude outward from the left and right ends of the horizontal flaps **33***a*, **33***b* into a space outside the contour of the first air outlet **32**. The protruding shafts **39***a*, **39***b* are coupled to the enclosure body **29** for relative rotating movement around the horizontal axes **34***a*, **34***b*, respectively. The protruding shafts **39***a*, **39***b* may be received on bearings integral to the enclosure body **29**, for example.

A flapping driving source **40** is connected to the protruding shafts **39***a*, **39***b*. The flapping driving source **40** may comprise an electric motor, for example. Follower gears **41** are fixed to the protruding shafts **39***a*, **39***b*, respectively, for example. A driving gear **42** is likewise fixed to the driving shaft of the electric motor. The driving gear **42** is engaged with the follower gears **41**. The driving power of the electric motor is in this manner transmitted to the protruding shafts **39***a*, **39***b* at a predetermined transmission ratio. The flapping driving source **40** serves to induce the swinging movement of the horizontal flaps **33***a*, **33***b*.

Vertical louvers **43** are also attached to the first air outlet **32**. The vertical louvers **43** are arranged along the horizontal axes **34***a*, **34***b* in the horizontal direction at equal intervals, for example. The individual vertical louver **43** is capable of rotating around a rotational axis **44**. The rotational axis **44** extends within a vertical plane perpendicular to the horizontal axes **34***a*, **34***b*. All the rotational axes **44** are included within an imaginary plane extending in parallel with the horizontal axes **34***a*, **34***b*. The imaginary plane is preferably set perpendicular to an airflow passage leading to the first air outlet **32**.

Protruding shafts **45** are formed on the individual vertical louver **43** in a manner coaxial with the corresponding rotational axis **44**. The protruding shafts **45** protrude upward and/or downward from the upper and/or lower ends of the individual vertical louvers **43**, for example. The protruding shafts **45** are coupled to the enclosure body **29** for relative rotating movement around the corresponding rotational axes **44**, respectively. The protruding shafts **45** may be received on corresponding bearing units fixed to the enclosure body **29**, for example.

A louver driving source **46** is connected to the protruding shafts **45**. The louver driving source **46** may comprise an electric motor, for example. An engaging shaft **47** is formed on the individual vertical louver **43**, for example. The engaging shaft **47** extends in parallel with the corresponding rotational axis **44** at a position offset from the corresponding rotational axis **44**. A rack member **48** is connected to the engaging shafts **47** for relative rotating movement around the respective longitudinal axes of the engaging shafts **47**. A driving gear **49** is fixed to the driving shaft of the electric motor. The driving gear **49** is engaged with teeth **51** of the rack member **48**. The driving power or rotary movement of the electric motor is in this manner transformed to linear motion of the rack member **48**. The rack member **48** serves to induce the swinging movement of the engaging shafts **47** around the corresponding rotational axes **44**. The vertical louvers **43** are in this manner caused to move for rotation.

As depicted in FIG. **4**, the indoor heat exchanger **14** and the first blower fan **27** are assembled into the enclosure body **29**. The first blower fan **27** is at least partly enclosed in the enclosure body **29**. A crossflow fan is employed as the first blower fan **27**. The crossflow fan includes a rotor **52** locating blades along a cylindrical surface of an elongated cylinder. The rotor **52** is configured to rotate around a rotation axis **53** extending in parallel with the horizontal axes **34***a*, **34***b*. An airflow passage is defined in the enclosure body **29** for airflow from the first blower fan **27**. The downstream end of the airflow passage forms the first air outlet **32**.

The indoor heat exchanger **14** includes a refrigerant piping **54**. The refrigerant piping **54** is made of a material having a high thermal conductivity such as copper. The refrigerant piping **54** is divided into a front section **55***a* and a rear section **55***b*. The front section **55***a* is disposed in a space interposed between the fan units **26**. The rear section **55***b* is disposed in a space outside the space between the fan units **26**. Specifically, the rear section **55***b* is contained within a space behind the space interposed between the fan units **26**. Accordingly, the rear section **55***b* enters into spaces behind the individual fan units **26**. As a result, the rear section **55***b* is allowed to expand wider in the lateral direction than the front section **55***a* is.

A front space **56***a* and a rear space **56***b* are defined in the main enclosure **28**. The front space **56***a* is located between the fan units **26**. The front space **56***a* has a first width W**1** in parallel with the rotation axis **53** of the first blower fan **27**. The front space **56***a* ends up at the opposite side walls of the enclosure body **29**. The rear space **56***b* is formed behind the front space **56***a*. The rear space **56***b* extends into a space behind the individual fan units **26**. The rear space **56***b* has a second width W**2** in parallel with the rotation axis **53** of the first blower fan **27**. The second width W**2** is set larger than the first width W**1**. The front section **55***a* of the indoor heat exchanger **14** is accommodated in the front space **56***a*. The rear section **55***b* of the indoor heat exchanger **14** is accommodated in the rear space **56***b*. The front section **55***a* inclines backward to offset the upper end of the front section **55***a* toward the rear side of the enclosure body **29** in a space between the fan units **26**. The rear section **55***b* inclines forward to offset the upper end of the rear section **55***b* toward the front side of the enclosure body **29**. The indoor heat exchanger **14** in this manner allows establishment of a roughly V-shaped arrangement of the front section **55***a* and the rear section **55***b*. The first blower fan **27** is disposed in a space between the front section **55***a* and the rear section **55***b*. The upper end of the front section **55***a* is coupled to the upper end of the rear section **55***b*.

As depicted in FIG. **5**, a second blower fan **57** is enclosed in the enclosure **35** of each of the fan units **57**. The second blower fan **57** is attached to the enclosure body **29**. The second blower fan **57** is coupled to the corresponding side wall of the enclosure body **29**. A sirocco fan is employed as the second blower fan **57**. The sirocco fan includes a rotor **58** locating blades along a cylindrical surface of a cylinder. The rotor **58** is configured to rotate around a rotation axis **59** extending in parallel with the horizontal axes **34***a*, **34***b*.

An opening **61** is formed in the side wall of the enclosure **35**. The opening **61** may have a circular contour coaxial with the rotation axis **59**, for example. The size of the opening **61** is set smaller than the inner diameter of the cylinder locating the blades in the rotor **58**. The second air inlet **38** in the side panel **31***a* is opposed to the opening **61**. When the rotor **58** is driven to rotate, a room air is sucked into the interior of the rotor **58** through the second air inlet **38** and the opening **61** in the direction of the rotation axis **59**. The sucked room air is pushed out in the centrifugal direction from the rotor **58**. The pushed room air is guided to the second air outlet **36** along an airflow passage provided in the enclosure **35**.

The fan unit **26** is supported on the main unit **25** for a relative attitude change to the main unit **25**. Specifically, the enclosure **35** of the fan unit **26** is attached to the corresponding side surface of the enclosure body **29** in the main unit **25** for relative rotational movement around the horizontal axis **37** to the enclosure body **29**. Here, the horizontal axis **37** may be aligned with the rotation axis **59** in a coaxial condition. An annular wall **62** is formed on the side surface or outer surface of the enclosure **35** in a manner coaxial with the horizontal axis **37**. The annular wall **62** is supported on a pair of first brackets **63** for relative rotating movement. The annular wall **62** has the outward surface along the cylindrical surface. The first brackets **63** are configured to sandwich the cylindrical surface for relative sliding movement.

Vertical louvers **64** are attached to the second air outlet **36**. Here, three of the vertical louvers **64** are supported on the enclosure **35**, for example. The vertical louvers **64** are arranged in the horizontal direction at equal intervals, for example. The vertical louvers **64** are capable of rotating around corresponding rotation axes **65**, respectively. The individual rotation axes **65** extend within vertical planes perpendicular to the horizontal axis **37**, respectively. All the rotation axis **65** extend within an imaginary plane extending in parallel with the horizontal axis **37**. The imaginary plane is preferably set perpendicular to an airflow passage leading to the second air outlet **36**.

As depicted in FIG. **6**, protruding shafts **66** are formed on each of the vertical louvers **64** in a manner coaxial with the corresponding rotation axis **65**. The protruding shafts **66** protrude upward and/or downward from the upper and/or lower ends of the individual vertical louver **64**, for example. The protruding shafts **66** are coupled to the enclosure **35** for relative rotating movement around the corresponding rotation axes **65**, respectively. The protruding shafts **66** may be received on corresponding bearings integral to the enclosure **35**, for example.

A louver driving source **67** are connected to the protruding shafts **66**. The louver driving source **67** may comprise an electric motor, for example. An engaging shaft **68** is formed on each of the vertical louvers **64**, for example. The engaging shaft **68** extends in parallel with the corresponding rotation axis **65** at a position offset from the corresponding rotation axis **65**. A connecting member **69** is connected to the engaging shafts **68** for relative rotating movement around the respective longitudinal axes of the engaging shafts **68**. A driving gear **71** is fixed to the driving shaft of the electric motor. A follower gear **72** is fixed to the protruding shaft **66** of one of the vertical louvers **64** in a manner coaxial with the longitudinal axis of the protruding shaft **66**. The driving gear **71** is engaged with the follower gear **72**. The driving power of the electric motor is in this manner transferred to the protruding shaft **66** of one vertical louver **64** at a predetermined transmission ratio. The rotating movement of one vertical louver **64** is transmitted to the remaining vertical louvers **64** through the connecting member **69** so as to cause the rotating movement of the remaining vertical louvers **64**. The vertical louvers **64** are in this manner caused to rotate.

As depicted in FIG. **7**, a first fan driving source **73** is connected to the first blower fan **27**. The first fan driving source **73** may comprise an electric motor, for example. The rotor **52** is fixedly coupled to the driving shaft of the electric motor in a manner coaxial with the driving shaft. When the first fan driving source **73** operates, the rotor **52** is caused to rotate. Airflow is generated in the interior space of the enclosure body **29**. The first fan driving source **73** is fixed to the side wall of the enclosure body **29** from the inside.

Second fan driving sources **74** are connected to the individual second blower fans **57**, respectively. The second fan driving source **74** may comprise an electric motor, for example. The rotor **58** is fixedly coupled to the driving shaft of the electric motor in a manner coaxial with the driving shaft. When the second fan driving source **74** operates, the rotor **58** is caused to rotate. Airflow is generated in the interior space of the enclosure **35**. The side walls of the enclosure body **29** serve to isolate the airflow in the enclosure **35** from the airflow in the enclosure body **29**. The individual second fan driving source **74** is fixed to the corresponding side wall of the enclosure body **29** from the outside, for example.

An annular wall **75** is formed in each of the fan units **26** on the enclosure **35** at the side surface, opposed to the enclosure body **29**. The annular wall **75** is coaxial with the annular wall **62**. The annular wall **75** is supported on a second bracket **76** for relative rotating movement. The annular wall **75** has the inward surface along the cylindrical surface. An annular flange **76***a* is formed in the second bracket **76** in a manner coaxial with the annular wall **75**. The annular flange **76** is received on the inner surface of the annular wall **75** for relative rotating movement. The enclosure **35** is in this manner stably supported at the opposite ends on a pair of the annular walls **62**, **75**.

Enclosure driving sources **77** are coupled to the enclosure **35**, respectively. The enclosure driving sources **77** may comprise an electric motor, for example. A driving gear **78** is fixed to the driving shaft of the electric motor. Teeth are formed on the outer surface of the annular wall **75** for engagement with the driving gear **78**. The driving power of the electric motor is transmitted to the enclosure **35** at a predetermined transmission ratio. The enclosure **35** of the individual fan unit **26** is driven to rotate around the horizontal axis in response to the operation of the enclosure driving source **77**. The rotating movement of the enclosure **35** enables movement of the individual second air outlet **36** around the corresponding horizontal axis **37**. The individual enclosure driving source **77** is fixed to the corresponding side wall of the enclosure body **29** from the inside, for example. The driving shaft of the electric motor may penetrate through the corresponding side wall of the enclosure body **29**. The annular walls **62**, **75**, the first and second brackets **63**, **76** and the enclosure driving source **77** in combination provide a driving mechanism designed to change the attitude of the enclosure **35** relative to the enclosure body **29**.

FIG. **8** schematically illustrates a block diagram of the controlling system of the air conditioner **11**. A controller unit **79** includes a cooling/heating establishment section **81**. The cooling/heating establishment section **81** is configured to control the operation of the refrigerant circuit **19**. The refrigerant circuit **19** selectively conducts the cooling operation or the heating operation under the control of the cooling/heating establishment section **81**. The outdoor unit **13** is connected to the cooling/heating establishment section **81**. The cooling/

heating establishment section **81** controls the operation of the compressor **15**, the expansion valve **17** and the four-way valve **18**. The cooling/heating establishment section **81** is configured to output control signals to the compressor **15**, the expansion valve **17** and the four-way valve **18** for controlling the operation of the compressor **15**, the expansion valve **17** and the four-way valve **18**. The control signal serves to change the position of the valve at the four-way valve **18**, for example.

The controller unit **79** includes a main unit controlling block **82**. The main unit controlling block **82** controls the operation of the main unit **25**. The main unit controlling block **82** includes a first fan controlling section **83**, a flapping controlling section **84** and a louver controlling section **85**. The first fan driving source **73** is electrically connected to the first fan controlling section **83**. The first fan controlling section **83** controls the operation of the first fan driving source **73**. The first fan controlling section **83** is configured to output a first driving signal to the first fan driving source **73** for controlling the operation of the first fan driving source **73**. The first fan driving source **73** realizes the start and termination of the operation of the first blower fan **27** as well as the control on the rotation speed of the first blower fan **27** in response to the reception of the first driving signal. The flapping driving source **40** of the main unit **25** is electrically connected to the flapping controlling section **84**. The flapping controlling section **84** controls the operation of the flapping driving source **40**. The flapping controlling section **84** is configured to output a control signal to the flapping driving source **40** for controlling the operation of the flapping driving source **40**. The flapping driving source **40** realizes the control on the orientation of the horizontal flaps **33***a*, **33***b* in response to the reception of the control signal. The louver driving source **46** is electrically connected to the louver controlling section **85**. The louver controlling section **85** controls the operation of the louver driving source **46**. The louver controlling section **85** is configured to output a control signal to the louver driving source **46** for controlling the operation of the louver driving source **46**. The louver driving source **46** realizes the control on the orientation of the vertical louvers **43** in response to the reception of the control signal.

The controller unit **79** includes a fan unit controlling block **86**. The fan unit controlling block **86** controls the operation of the fan units **26**. The fan unit controlling block **86** includes a second fan controlling section **87**, an enclosure attitude controlling section **88** and a louver controlling section **89**. The second fan driving sources **74** are independently electrically connected to the second fan controlling section **87**. The second fan controlling section **87** independently controls the operation of the second fan driving sources **74**. The second fan controlling section **83** is configured to separately supply a second driving signal to the individual second fan driving source **74** for controlling the operation of the individual second fan driving source **74**. The individual second fan driving source **74** realizes the start and termination of the operation of the corresponding second blower fan **57** as well as the control on the rotation speed of the corresponding second blower fan **57** in response to the reception of the second driving signal. The enclosure driving sources **77** of the fan units **26** are independently electrically connected to the enclosure attitude controlling section **88**. The enclosure attitude controlling section **88** controls the operation of the individual enclosure driving sources **77**. The enclosure attitude controlling section **88** is configured to separately supply a third driving signal to the individual enclosure driving source **77** for controlling the operation of the individual enclosure driving source **77**. The individual enclosure driving source **77** realizes the control on the orientation of the corresponding enclosure **35** in response to the reception of the third driving signal. The louver driving sources **67** are independently electrically connected to the louver controlling section **89**. The louver controlling section **85** controls the operation of the individual louver driving sources **46**. The louver controlling section **85** is configured to separately supply a control signal to the individual louver driving source **67** for controlling the operation of the individual louver driving source **67**. The individual louver driving source **67** realizes the control on the orientation of the corresponding vertical louvers **64** in response to the reception of the control signal.

A light receiving element **91** is connected to the controller unit **79**. The light receiving element **91** is configured to receive command signals from a remote controller unit, for example, by air. The command signals serve to specify the operating mode of the air conditioner **11**, the set temperature, and the like, for example. The remote controller unit is manipulated to input the operating mode, the set temperature, or the like, to generate the command signals. The list of the operating mode may include "cooling mode", "heating mode", "dehumidifying mode" and "blower mode". The light receiving element **91** is configured to output the received command signals. The command signals are supplied to the cooling/heating establishment section **81**, the main unit controlling block **82** and the fan unit controlling block **86**, respectively. The cooling/heating establishment section **81**, the main unit controlling block **82** and the fan unit controlling block **83** respectively operate in accordance with the operating mode, the set temperature, and the like, specified in the command signals.

A room temperature sensor **92** is connected to the controller unit **79**. The room temperature sensor **92** is attached to the indoor unit **12**, for example. The room temperature sensor **92** is configured to detect the ambient temperature around the indoor unit **12**. The room temperature sensor **92** outputs a temperature signal in accordance with the detected result. The temperature signal serves to specify the room temperature. The temperature signal is supplied to the main unit controlling block **82** and the fan unit controlling block **86**, for example. The main unit controlling block **82** and the fan unit controlling block **86** are allowed to refer to the temperature specified in the temperature signal so as to execute the control.

A human sensor **93** is connected to the controller unit **79**. The human sensor **93** is attached to the indoor unit **12**, for example. The human sensor **93** is configured to detect the existence of the human being, the location of the human being, or the like. The human sensor **93** outputs a detect signal in accordance with the detected result. The detect signal serves to specify the presence of the human being, the location of the human being, or the like. The detect signal is supplied to the cooling/heating establishment section **81**, the main unit controlling block **82** and the fan unit controlling block **86**, for example. The cooling/heating establishment section **81**, the main unit controlling block **82** and the fan unit controlling block **86** are allowed to refer to the presence, the location, or the like, of the human being specified in the detect signal so as to execute the control.

It should be noted that the controller unit **79** may comprise a processing circuit such as a microprocessor unit (MPU), for example. A non-volatile storage unit may be built-in or externally attached to the processing circuit, for example. The storage unit may store a predetermined controlling program. The processing circuit executes the controlling program so as to function as the controller unit **79**.

Next, a description will be made on the operation of the air conditioner **11**. Assuming that a first mode of the cooling operation is selected, for example, the cooling/heating establishment section **81** outputs a control signal for establishing the cooling operation. The control signals are supplied to the compressor **15**, the expansion valve **17**, the four-way valve **18**, and the like. The four-way valve **18** is controlled to connect the second port **18***b* and the third port **18***c* to each other and the first port **18***a* and the fourth port **18***d* to each other. The compressor **15** operates to circulate the refrigerant through the refrigerant circuit **19**. A cool air is thus generated at the indoor heat exchanger **14**. The temperature of the cool air is lower than at least the temperature of the room air. The compressor **15** is controlled to operate in accordance with the room temperature detected at the room temperature sensor **92**. In addition, when the human sensor **93** keeps detecting the nonexistence of the human being in the room for a predetermined duration of time, the compressor **15** may be made inoperative.

The first fan controlling section **83** of the main unit controlling block **82** outputs the first driving signal for driving the first blower fan **27**. The first driving signal is supplied to the first fan driving source **73**. The first blower fan **27** is driven to rotate. Airflow of the cooling air is discharged out of the first air outlet **32**. Here, the flapping controlling section **84** of the main unit controlling block **82** outputs the control signal for driving the horizontal flaps **33***a*, **33***b* of the main unit **25**. The control signal is supplied to the flapping driving source **40**. As depicted in FIG. **9**, the horizontal flaps **33***a*, **33***b* are forced to take the horizontal attitude. The horizontal flaps **33***a*, **33***b* serve to guide the discharge of the airflow **94** from the first air outlet **32** in the horizontal direction. The airflow **94** of the cool air is discharged out of the first air outlet **32** in the horizontal direction.

The second fan controlling section **87** of the fan unit controlling block **86** outputs the second driving signals for driving the individual second blower fans **57**. The second driving signals are supplied to the individual second fan driving source **74**, respectively. The individual second blower fans **57** are driven to rotate. A room air is sucked into the interior space inside the enclosure **35** through the second air inlet **38** and the opening **61** in the respective fan unit **26**. The temperature of the room air is equal to the room temperature. The sucked room air is discharged out of the second air outlet **36** of the respective fan unit **26** as it is, specifically without being subjected to heat exchange of the indoor heat exchanger **14**. Here, the enclosure attitude controlling section **88** of the fan unit controlling block **86** outputs the third driving signals for driving the annular walls **62**, **75** relative to the first and second brackets **63**, **76**. The third driving signals are supplied to the enclosure driving sources **77** in the individual fan units **26**, respectively. As depicted in FIG. **9**, the enclosure **35** is forced to take an ascendant attitude, shifted from the horizontal attitude. The enclosure **35** serves to guide the discharge of airflow **95** from the second air outlet **36** in an ascendant direction, inclined forward beyond the horizontal direction. The airflow **95** of the room air is discharged out of the second air outlet **36** in the descendant direction.

As depicted in FIG. **10**, the indoor unit **12** is in general mounted at a relatively high position in the room. When the airflow **94** of the cool air is guided in the horizontal direction, the cool air is allowed to fall down from the higher level toward the floor. The cool air is gradually accumulated on the floor in the room. Here, the fan units **26** serve to direct the airflow **95** of the room air directly to the human being M in the room. The fan units **26** are allowed to function as a simple fan or blower during the cooling operation. The airflow **95** of the room air is prevented from being mixed with the cool air, so that the human being M in the room is allowed to feel a comfortable cooled condition. The human being M is capable of enjoying the cooling effect resulting from not only a reduction in the room temperature but also heat radiation from the skin through the contact of the airflow **95**.

In addition, the enclosure attitude controlling section **88** determines the attitude of the enclosure **35** in the individual fan unit **26** based on the detect signal output from the human sensor **93**. Likewise, the louver controlling section **89** of the individual fan unit **26** determines the orientation of the vertical louvers **64** based on the detect signal output from the human sensor **93**. The human sensor **93** thus contributes to establishment of the airflow **95** from the second air outlet **36** directed to the human being M in the room with a high accuracy. The human sensor **93** may be utilized to allow the airflow **95** of the room air to follow the movement of the human being M in the room. Even when the human being M moves in the room, the airflow **95** of the room air keeps reaching the human being M moving in the room. The human being M in the room is reliably allowed to enjoy the cooling effect resulting from the contact of the airflow **95**. The enclosure attitude controlling section **88** separately and independently controls the attitudes of the enclosures **35**, so that the attitudes of the enclosures **35** can be controlled appropriately in accordance with the number and locations of the human being M in the room. The separate individual fan units **26** are capable of forming the separate airflow **95** of the room air accurately directed to the human being M.

Next, assuming that a second mode of the cooling operation is selected, the cooling/heating establishment section **81** operates to establish the cooling operation in the refrigerant circuit **19** in the aforementioned manner. The main unit controlling block **82** operates to discharge the airflow **94** of the cool air from the first air outlet **32** in the horizontal direction in the manner as described above. And, the fan units **26** are controlled to discharge the airflow **95** of the room air from the second air outlet **36**. Here, the third driving signals from the enclosure attitude controlling section **88** serve to determine the attitude of the enclosures **35** for discharging the airflow **95** of the room air in the horizontal direction, as depicted in FIG. **11**.

Here, if the flow rate of the airflow **95** of the second air outlet **36** is larger than the flow rate of the airflow **94** of the first air outlet **32**, the airflow **95** having a larger flow rate can be utilized to restrict or guide the airflow **94** having a smaller flow rate, as depicted in FIG. **12**, for example. The airflow **95** of the room air can be utilized to control the orientation and movement of the airflow **94** of the cool air. The cool air can be conveyed to a desired location in the room. Here, the airflow **95** from the second air outlet **36** flows along the ceiling and the wall to moderately fall onto the floor together with the airflow **94** of the cool air. A moderate flow of air is generated along the floor in the room. The human being M in the room is allowed to enjoy a natural comfortable cooled condition with a breeze of the convection. The fan units **26** may take an attitude for discharging the airflow **95** of the room air in an ascendant direction, headed upward beyond the horizontal direction, when the fan units **26** are utilized to generate a moderate flow of air.

As depicted in FIG. **13**, the flow rate of the airflow **94** of the first air outlet **32** gets remarkably smaller when the room temperature is kept at the set temperature, for example. Here, a third mode of the cooling operation can be established. The louver controlling section **89** of the fan unit controlling block **86** serves to control the orientation of the vertical louvers **64** at the second air outlet **36** in the third mode. The front ends of the vertical louvers **64** are directed toward the main unit **25** in the respective fan units **26**. Accordingly, the airflows **95** of the room air are discharged out from the second air outlets **36** so as to get closer to each other. It should be noted that the horizontal flaps **33***a*, **33***b* of the first air outlet **32** and the enclosures **35** take attitudes identical to those of the second mode.

As depicted in FIG. **13**, when the airflow **95** having a larger flow rate has been discharged out from the second air outlets **36**, the airflow **94** of the cool air is caught in the airflow **95** of the room air having a larger flow rate. Accordingly, the airflow **94** of the cool air is conveyed farther with the assistance of the airflow **95** of the room air. Even when the flow rate of the airflow **94** of the cool air gets smaller, the airflow **94** of the cool air can reach farther locations. Even though the flow rate of air is reduced, the room is cooled in an efficient manner. On the other hand, if the airflow **94** of the cool air is discharged solely out of the first air outlet **32**, the airflow **94** of the cool air having a smaller flow rate cannot sufficiently spread in the room. The room atmosphere suffers from an unequal temperature distribution.

When the heating operation is selected, for example, the cooling/heating establishment section **81** outputs a control signal for establishing the heating operation. The control signals are supplied to the compressor **15**, the expansion valve **17**, the four-way valve **18**, and the like. The four-way valve **18** is controlled to connect the second port **18***b* and the fourth port **18***d* to each other and the first port **18***a* and the third port **18***c* to each other. The compressor **15** operates to circulate the refrigerant through the refrigerant circuit **19**. A warm air is thus generated at the indoor heat exchanger **14**. The temperature of the warm air is higher than at least the temperature of the room air. The compressor **15** is controlled to operate in accordance with the room temperature detected at the room temperature sensor **92**. In addition, when the human sensor **93** keeps detecting the nonexistence of the human being in the room for a predetermined duration of time, the compressor **15** may be made inoperative.

The warm air is discharged out of the first air outlet **32** in response the rotation of the first blower fan **27** in the heating operation. Here, the flapping controlling section **84** of the main unit controlling block **82** supplies the control signal to the flapping driving source **40** so as to establish a descendant attitude of the horizontal flaps **33***a*, **33***b*, as depicted in FIG. **14**. The horizontal flaps **33***a*, **33***b* serve to guide the discharge of the airflow **94** through the first air outlet **32** in the descendant direction to the floor. The airflow **94** of the warm air is discharged out of the first air outlet **32** in the descendant direction.

When the heating operation has begun, the controller unit **79** conducts a first mode of the heating operation. The enclosure attitude controlling section **88** of the fan unit controlling block **86** supplies the control signal to the enclosure driving source **77** so as to change the attitude of the enclosures **35** to the horizontal attitude, as depicted in FIG. **14**. The enclosures **35** serve to guide the discharge of the airflow **95** from the second air outlet **36** in the horizontal direction. The airflow **95** of the room air is discharged out of the second air outlet **36** in the horizontal direction. The fan units **26** keep the attitude designed for the discharge in the horizontal direction until the room temperature reaches a predetermined temperature lower than the set temperature, for example. The room temperature can be detected at the room temperature sensor **92**.

When the airflow **94** of the warm air is guided in the descendant direction, the warm air is forced to flow downward to the floor. As depicted in FIG. **15**, the warm air tends to immediately lift up from the floor toward the ceiling when the room temperature is relatively low, for example. Here, the fan units **26** serve to generate a convection or an airflow in the room catching the warm air flowing upward. The caught warm air is caused to fall downstream toward the floor. The warm air is allowed to sufficiently flow into the lower space of the room. Even though the entire space in the room cannot be heated, the human being M in the room feels warmness.

When the room temperature has reached the predetermined temperature lower than the set temperature, the controller unit **79** operates to establish a second mode of the heating operation. As depicted in FIG. **16**, the enclosure attitude controlling section **88** serves to establish a descendant attitude of the enclosures **35**, for example. The enclosures **35** of the fan units **26** establish the attitude for discharging the airflow **95** in the descendant direction from a position higher than the first air outlet **32** in the same manner as the horizontal flaps **33***a*, **33***b*. The airflow **95** of the fan units **26** flows downward above the airflow **94** of the warm air, as depicted in FIG. **17**, for example. The airflow **95** of the fan units **26** serves to hold the warm air against the floor. The airflow **95** thus prevents the warm air from flowing upward. The human being M in the room is allowed to feel the warmness at his/her feet. The room temperature has reached the predetermined temperature, although lower than the set temperature, the human being M in the room can avoid feeling coldness resulting from the contact of the airflow **95** of the room air.

The air conditioner **11** allows the main unit **25** to discharge the airflow **94** of the cool air or the warm air out of the first air outlet **32**. The airflow **95** of the room air is discharged out of the second air outlets **36** of the fan units **26**. The airflow **95** of the room air can be utilized to control the direction and/or movement of the airflow **94** of the cool air or the warm air. The cool air or the warm air is conveyed to the desired locations in the room. The temperature environment is in this manner efficiently enhanced. In this case, the second air outlets **36** of the fan units **26** are allowed to move relative to the first air outlet **32** of the main unit **25**. Accordingly, the airflow **95** of the room air can be guided in a desired direction. The direction of the airflow **95** serves to appropriately control the direction and/or movement of the airflow **94** of the cool air or the warm air.

The second air outlets **36** of the fan units **26** are located ahead of the first air outlet **32** of the main unit **25** in the air conditioner **11**. The second air outlets **36** are arranged downstream of the burble point of the horizontal flaps **33***a*, **33***b* along the stream of the airflow **94**. Accordingly, the airflow **95** of the fan units **26** is allowed to flow out of the second air outlets **36** without being hindered with the enclosure body **29** and/or the outer panel **31**.

In addition, the rear section **55***b* of the indoor heat exchanger **14** has the width larger than the width of the rear section **55***b* of the indoor heat exchanger **14**. Spaces behind the fan units **26** are effectively utilized to accommodate the rear section **55***b* of the indoor heat exchanger **14**. Accordingly, the indoor heat exchanger **14** is prevented from a reduction in the width to the utmost irrespective of the disposition of the fan units **26**.

FIG. **18** schematically illustrates the indoor unit **12***a* according to a second embodiment. The side surfaces of the enclosure body **29** defined along a pair of vertical planes perpendicular to the horizontal axes **34***a*, **34***b* in this second embodiment. The enclosure body **29** terminates at the vertical planes. The fan units **26** are located on the outer surface of the vertical planes. Accordingly, the rotary movement of the fan units **26** is not hindered with the outer panel **31**. In addition, the second air outlet **36** is made larger in size in the respective fan units **26**. The other structure and components are identical to those of the aforementioned indoor unit **12** according to the first embodiment. In figures, identical reference numerals are attached to the structure and components identical to those of the aforementioned indoor unit **12** according to the first embodiment.

All examples and conditional language recited herein are intended for pedagogical purposes to aid the reader in understanding the invention and the concept contributed by the inventor to furthering the art, and are to be construed as being without limitation to such specifically recited examples and conditions, nor does the organization of such examples in the specification relate to a showing of the superiority and inferiority of the invention. Although the embodiments of the present inventions have been described in detail, it should be understood that the various changes, substitutions, and alterations could be made hereto without departing from the spirit and scope of the invention.

What is claimed is:

1. An air conditioner comprising:

a main unit having an enclosure defining an air outlet, the enclosure containing a heat exchanger generating a cool air or a warm air forming an airflow running out of the air outlet into a room space; and

a pair of fan units disposed on opposite sides of the air outlet, the fan units being configured to suck a room air and to blow the room air at room temperature into the room space, wherein

the heat exchanger includes:

a front section disposed in a space between the fan units; and

a rear section having a length larger than that of the front section in a longitudinal direction of the air outlet, wherein

the rear section extends into at least one of spaces respectively defined behind the fan units.

2. The air conditioner according to claim **1**, further comprising:

a first driving source configured to drive a first blower fan contained inside the enclosure; and

a second driving source, independent of the first driving source, configured to drive a second blower fan contained in an enclosure of each of the fan units.

3. The air conditioner according to claim **2**, wherein the fan units are supported on the main unit for a relative attitude change to the main unit.

* * * * *